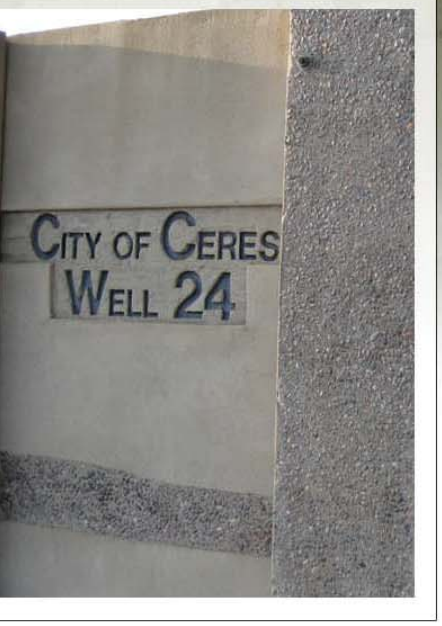

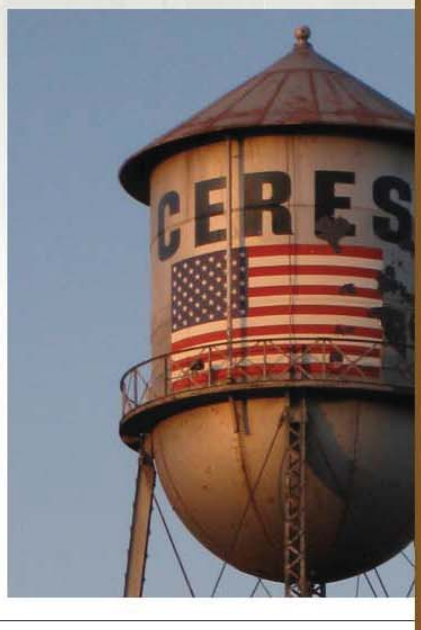

FINAL

CITY OF CERES

2010 Urban Water Management Plan

WEST YOST ASSOCIATES

2010 Urban Water Management Plan

Prepared for

City of Ceres

June 2011

WEST YOST ASSOCIATES

341-02-10-10

Gerry Nakano

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AB 1420	Assembly Bill 1420
AB 32	Global Warming Solutions Act of 2006
AB 797	Assembly Bill 797
Act	Urban Water Management Planning Act
AFY	Acre Feet Per Year
AMI	Automatic Meter Infrastructure
AMR	Automatic Meter Read
AWWA	American Water Works Association
BMPs	Best Management Practices
CalGreen	California Green Building Standards
CBDA	California Bay-Delta Authority
CII	Commercial, Industrial, and Institutional
CIMIS	California Irrigation Management Information System
City	City of Ceres
CREEC	California Regional Environmental Education Consortium
CUWCC	California Urban Water Conservation Council
DMMs	Demand Management Measures
DOF	Department of Finance

DOST	DWR Online Submittal Tool
DWR	California Department of Water Resources
DWR Methodologies	Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use, October 1, 2010
ET	Evapotranspiration
GHG	Greenhouse Gases
gpcd	Gallons Per Capita Per Day
gpm	Gallons Per Minute
HECW	High-Efficiency Clothes Washers
IRWMP	Integrated Regional Water Management Plan
MCLs	Maximum Contaminant Levels
MG	Million Gallons
MGD	Million Gallon Per Day
MOU	Memorandum of Understanding
NPDES	National Pollutant Discharge Elimination System
PG&E	Pacific Gas & Electric
Plan	Turlock Groundwater Basin Management Plan
RSWSP	Regional Surface Water Supply Project
RWQCF	Regional Water Quality Control Facility
SBx7-7	Water Conservation Act of 2009, Senate Bill x7-7
SOI	Sphere of Influence
STEEP	Stanislaus County Office of Education's Stanislaus/Tuolumne Environmental Education Project
SWRCB	State Water Resources Control Board
TBD	To Be Determined
TID	Turlock Irrigation District
ULFT	Ultra-Low Flush Toilets
UWMP	Urban Water Management Plan
UWMP Act	Urban Water Management Planning Act
WDR	Waste Discharge Requirement
West Yost	West Yost Associates
WET	Water Education for Teachers
WSS	WaterSense Specification
WWTP	Wastewater Treatment Plant

Executive Summary

ES.1 INTRODUCTION

This 2010 Urban Water Management Plan (UWMP) Update has been prepared for the City of Ceres (City) by West Yost Associates (West Yost). This 2010 UWMP for the City describes the current and future water use, sources of supply and its reliability, and existing and planned conservation measures.

This 2010 UWMP complies with the Urban Water Management Planning Act (UWMP Act), which was originally established by Assembly Bill 797 (AB 797) on September 21, 1983. The law requires water suppliers in California providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet per year (AFY) of water to prepare and adopt an UWMP every five years.

Several changes to the UWMP Act have been approved in recent years. Revisions to the UWMP Act include requiring a robust supply and demand comparison, as well as detailed discussion of groundwater resources, water recycling and desalination. This 2010 UWMP is also required to comply with the requirements of the Water Conservation Act of 2009, Senate Bill x7-7 (SBx7-7) which was enacted in November 2009. SBx7-7 requires urban retail water suppliers, such as the City of Ceres, to develop per capita water use targets to be met by 2015 and 2020. The overall statewide objective of SBx7-7 is to reduce per capita water use by 20 percent by the year 2020.

The requirements of SBx7-7 extended the deadline for adoption of the 2010 UWMPs for urban retail water suppliers from December 31, 2010 to July 1, 2011.

ES.2 PLAN ADOPTION

The City adopted this 2010 UWMP on June 27, 2011. A copy of the adoption resolution is included in Appendix B.

Following plan adoption, the 2010 UWMP was submitted to the Department of Water Resources (DWR) and to the California State Library. Copies of the adopted 2010 UWMP were also provided to the following agencies and service areas within 30 days of adoption:

- City of Modesto,
- City of Turlock,
- Stanislaus County, and
- Turlock Irrigation District.

Within 30 days of submitting the adopted 2010 UWMP to DWR, copies of the adopted 2010 UWMP will be made available during normal business hours at the following locations:

- City of Ceres, Public Works Department, 2220 Magnolia Street, Ceres, CA 95307
- City of Ceres, Library, 2250 Magnolia Street, Ceres, CA 95307
- City of Ceres, Community Center, 2701 Fourth Street, Ceres, CA 95307

A copy of the adopted 2010 UWMP will also be available on the City's website:

- City of Ceres website (http://www.ci.ceres.ca.us)

Should this 2010 UWMP be amended or changed, copies of amendments or changes to the plan shall be submitted to DWR, the California State Library, and previously mentioned agencies receiving copies of the plan within 30 days after adoption.

ES.3 PLAN OVERVIEW

ES.3.1 Service Area

The City supplies water to nearly all residential, commercial, industrial, institutional and governmental water users within the City limit. The City's water service area is generally contiguous with the City limit; however, the northwest portion of the City receives water service from the City of Modesto. The City also provides water service for a small number of customers who are outside of the current City limit, but are within the City's Primary Sphere of Influence (SOI). The City currently serves approximately 42,000 people within its service area. It is estimated that approximately 1,200 people in the northwestern portion of the City are served by the City of Modesto.

ES.3.2 Water Demand

Unlike past UWMPs, the projected water demand in this 2010 UWMP is primarily driven by the per capita water use targets mandated by the Water Conservation Act of 2009 (enacted by Senate Bill SBx7-7 in November 2009). As part of the City's compliance with SBx7-7, the City has established its baseline per capita water use and has established and adopted a 2015 interim per capita water use target and a 2020 final per capita water use target. The development of the City's baseline and target per capita water uses are described in Chapter 4 and Appendix F and are summarized as follows:

- Baseline Per Capita Water Use: 243 gallons per capita per day (gpcd)
- 2015 Interim Per Capita Water Use Target: 219 gpcd
- 2020 Final Per Capita Water Use Target: 194 gpcd

Projected interim and final target water demands were then determined by multiplying the per capita water use targets by the respective projected service area populations. Projected water demands are summarized in Table ES-1.

Table ES-1. City of Ceres Projected Water Demand, AFY[a]

Water Use	2010 (actual)	2015	2020	2025	2030	2035
Total Projected Demand (including unaccounted for water[a])	8,284	10,700[b]	12,300[c]	14,800	17,300	19,800

[a] Unaccounted for system losses are estimated to be 15 percent of total production for 2015. After 2015, it is assumed that unaccounted for system losses will decrease to 10 percent to account for improved leak detection and repair when the City is fully metered.
[b] Consistent with City's interim gpcd target of 219 gpcd per SBx7-7 (219 gpcd x 43,600 service area population = 10,700 AFY).
[c] Consistent with City's final gpcd target of 194 gpcd per SBx7-7 (194 gpcd x 56,725 service area population = 12,300 AFY).

ES.3.3 Demand Management and Water Conservation

The City's compliance with the established SBx7-7 targets will be achieved through the implementation of the City's recently developed Demand Management Measure Implementation Plan. As described in Chapter 5, the City has implemented almost all of the foundational and programmatic Best Management Practices (BMPs) included in the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding (MOU).

Implementation of these conservation programs will allow the City to achieve the water reduction goals required by SBx7-7. In particular, the City is anticipating completion of the meter retrofit/installation project by approximately April/May 2011, and will be implementing a new metered rate structure by September 2011 that will help the City to monitor and track actual water use, and reduce per capita water use throughout the City's water service area. The completion of the metering program will also allow the City to perform system water audits and assist the City in identifying and reducing system losses due to pipeline leaks. Other key programs will be those that target the reduction of outdoor water uses, including residential landscape water surveys (BMP 3.2).

ES.3.4 Projected Water Supply

As described in Chapter 3, the City relies solely on groundwater pumped from the Turlock Subbasin to meet current water demands. The future supply for the City is anticipated to be a mix of local groundwater supply and surface water supply from the proposed Regional Surface Water Supply Project (RSWSP).

The City's current average annual groundwater production of approximately 10,000 AFY appears to be sustainable in the future. As described in Chapter 3, in the future, groundwater pumpage is expected to be reduced with the introduction of additional surface water supplies from the RSWSP (anticipated to be completed by 2018).

Table ES-2 summarizes the anticipated use of available water supplies to meet future demands.

Table ES-2. City of Ceres Current and Planned Water Supplies, AFY

Supply	2010 (actual)	2015	2020	2025	2030	2035
City produced groundwater[a]	8,284	10,700	5,600	8,100	10,600	13,100
Potential RSWSP surface water[b]	0	0	6,700	6,700	6,700	6,700
Total[c]	8,284	10,700	12,300	14,800	17,300	19,800

(a) Groundwater quantity calculated based on remaining supply required to meet the City's total demand.
(b) Once the RSWSP is operational, anticipated by 2018, an additional 6,700 AFY of demand will be met with surface water supplies.
(c) 2035 demand for the City's entire water service area is 19,800 AFY based on current projections developed in this UWMP. Projections incorporate anticipated conservation reductions to comply with SBx7-7.

As described in Chapter 9, based on the anticipated reliability of the City's water supplies (assuming the City's participation in the RSWSP) during normal, single dry and multiple dry years, the City anticipates that it has adequate water supplies to meet projected water demands during all hydrologic conditions through 2035.

ES.3.5 Water Shortage Contingency Plan

In the event of water shortages, due to prolonged drought conditions or other water supply outages, the City has developed a Water Shortage Contingency Plan delineating four stages of action, triggers, prohibitions and other water consumption reduction methods and associated penalties and charges for violating the established water use restrictions. The four stages of the plan are intended to address up to a 50 percent reduction in available water supplies. This plan is described in Chapter 10 of this 2010 UWMP.

ES.4 ON-LINE SUBMITTAL TO DWR USING DOST

This 2010 UWMP has been submitted to DWR using the DWR On-line Submittal Tool (DOST). A printout of the data submitted via DOST is included in Appendix K.

ES.5 DEMONSTRATION OF PLAN COMPLETENESS

This 2010 UWMP complies with the requirements of the UWMP Act, as amended by recently enacted legislation. DWR's Urban Water Management Plan Checklist, as provided in the 2010 UWMP Guidebook has been completed by West Yost to demonstrate the plan's compliance with applicable requirements. A copy of the completed checklist is included in Appendix L.

Furthermore, this 2010 UWMP contains all of the tables recommended by DWR. Table ES-3 provides a listing of the required DWR tables with a cross-reference to the table locations in this 2010 UWMP.

Table ES-3. Location of DWR Recommended Tables

DWR Table Number and Title	2010 UWMP Chapter and Table Number	
Table 1. Coordination with Appropriate Agencies	Chapter 1	Table 1-1
Table 2. Population—Current and Projected	Chapter 2	Table 2-3
Table 3. Water Deliveries—Actual, 2005	Chapter 4	Table 4-1
Table 4. Water Deliveries—Actual, 2010	Chapter 4	Table 4-2
Table 5. Water Deliveries—Projected, 2015	Chapter 4	Table 4-3
Table 6. Water Deliveries—Projected, 2020	Chapter 4	Table 4-4
Table 7. Water Deliveries—Projected, 2025, 2030 and 2035	Chapter 4	Table 4-5
Table 8. Low-Income Projected Water Demands	Chapter 4	Table 4-6
Table 9. Sales to Other Water Agencies	Chapter 4	Table 4-7
Table 10. Additional Water Uses and Losses	Chapter 4	Table 4-8
Table 11. Total Water Use	Chapter 4	Table 4-9
Table 12. Retail Agency Demand Projections Provided to Wholesale Suppliers	Chapters 3 and 4	Tables 3-5 and 4-10
Table 13. Base Period Ranges	Chapter 4	Table 4-11
Table 14. Base Daily Per Capita Water Use—10- to 15-Year Range	Chapter 4	Table 4-12
Table 15. Base Daily Per Capita Water Use—5-Year Range	Chapter 4	Table 4-13
Table 16. Water Supplies—Current and Projected	Chapter 3	Table 3-7
Table 17. Wholesale Supplies—Existing and Planned Sources of Water	Chapter 3	Table 3-7
Table 18. Groundwater—Volume Pumped	Chapter 3	Table 3-1
Table 19. Groundwater—Volume Projected to be Pumped	Chapter 3	Table 3-4
Table 20. Transfer and Exchange Opportunities	Chapter 3	Table 3-6
Table 21. Recycled Water—Wastewater Collection and Treatment	Chapter 8	Table 8-1
Table 22. Recycled Water—Non-Recycled Wastewater Disposal	Chapter 8	Table 8-2
Table 23. Recycled Water—Potential Future Use	Chapter 8	Table 8-4
Table 24. Recycled Water—2005 UWMP Use Projection Compared to 2010 Actual	Chapter 8	Table 8-3
Table 25. Methods to Encourage Recycled Water Use	Chapter 8	Table 8-5
Table 26. Future Water Supply Projects	Chapter 6	Table 6-5
Table 27. Basis of Water Year Data	Chapter 6	Table 6-2
Table 28. Supply Reliability—Historic Conditions	Chapter 6	Table 6-3
Table 29. Factors Resulting in Inconsistency of Supply	Chapter 6	Table 6-1
Table 30. Water Quality—Current and Projected Water Supply Impacts	Chapter 7	Table 7-1
Table 31. Supply Reliability—Current Water Sources	Chapter 6	Table 6-4
Table 32. Supply and Demand Comparison—Normal Year	Chapter 9	Table 9-3
Table 33. Supply and Demand Comparison—Single Dry Year	Chapter 9	Table 9-6
Table 34. Supply and Demand Comparison—Multiple Dry Year Events	Chapter 9	Table 9-9
Table 35. Water Shortage Contingency—Rationing Stages to Address Water Supply Shortages	Chapter 10	Table 10-1
Table 36. Water Shortage Contingency—Mandatory Prohibitions	Chapter 10	Table 10-2
Table 37. Water Shortage Contingency—Consumption Reduction Methods	Chapter 10	Table 10-2
Table 38. Water Shortage Contingency—Penalties and Charges	Chapter 10	Table 10-3

CHAPTER 1
Introduction

1.1 INTRODUCTION

The Urban Water Management Planning Act (Act) was originally established by Assembly Bill 797 (AB 797) on September 21, 1983. Passage of this law was recognition by state legislators that water is a limited resource and a declaration that efficient water use and conservation would be actively pursued throughout the state. The law requires water suppliers in California providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet per year (AFY) of water to prepare and adopt an Urban Water Management Plan (UWMP) every five years.

Several changes to the Urban Water Management Planning Act have been approved in recent years. Revisions to the Act include requiring a robust supply and demand comparison, as well as detailed discussion of groundwater resources, water recycling and desalination. Also, this 2010 UWMP is also required to comply with the requirements of the Water Conservation Act of 2009 (Senate Bill x7-7, or SBx7-7) which was enacted in November 2009. SBx7-7 requires urban retail water suppliers, such as the City of Ceres, to develop per capita water use targets to be met by 2015 and 2020. The overall statewide objective of SBx7-7 is to reduce per capita water use by 20 percent by the year 2020.

The requirements of SBx7-7 required DWR to extend the deadline for adoption of the 2010 UWMPs for urban retail water suppliers from December 31, 2010 to July 1, 2011. Similar legislation (SB 1478) was passed in September 2010 to also extend the adoption submittal deadline for urban wholesale water suppliers' UWMPs to July 1, 2011, to allow for coordination between retail and wholesale water suppliers.

A copy of the current version of the Urban Water Management Planning Act, the Water Conservation Act of 2009 (SBx7-7) and SB 1478 is provided in Appendix A of this document.

1.2 PLAN ORGANIZATION

This 2010 UWMP Update for the City of Ceres (City) describes the current and future water use, sources of supply and its reliability, and existing and planned conservation measures.

The City of Ceres' 2010 UWMP Update has been prepared by West Yost Associates (West Yost). This 2010 UWMP contains the appropriate sections and tables required per California Water Code Division 6, Part 2.6 (Urban Water Management Planning Act), included in Appendix A of this document.

To demonstrate the completeness of this 2010 UWMP, the UWMP checklist provided in DWR's "Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan" has been completed and is included in Appendix L.

1.3 BACKGROUND AND ANTICIPATED BENEFITS

The purpose of the UWMP is to provide a planning tool for the City for developing and delivering municipal water supplies to the City's water service area. The primary basis for this 2010 UWMP Update is the 2010 City of Ceres Water Master Plan which was completed for the City in Spring 2011 by West Yost.

1.3.1 Background

The City currently relies solely on groundwater pumped from the Turlock Groundwater Subbasin to supply its municipal water supply needs. A summary of the City's service area, facilities, and demographic information can be found in Chapter 2.

The City is currently pursuing the option of participating in the Regional Surface Water Supply Project (RSWSP) with TID-supplied water to diversify its water supply portfolio and improve the overall reliability and water quality of the City's water supplies. Discussions between the four participating cities are on-going; however, no agreements have been developed. However, if the City were to participate, the RSWSP would allow the City to conjunctively use surface and groundwater supplies to serve its customers. Further discussion of this potential future supply is provided in Chapter 3.

The Turlock Groundwater Subbasin is an unadjudicated groundwater basin. This means that there is no court-appointed "watermaster" to resolve groundwater pumping issues, and there are no specific limits on the amount of groundwater that individuals and agencies may extract from the basin. The City is currently dependent on groundwater for 100 percent of its total supply, and will continue to use groundwater pumping to meet demands until participation in the RSWSP is confirmed and construction of the RSWSP is completed (anticipated by 2018). Once the RSWSP is completed, there will be sufficient surface water treatment capacity to deliver an additional 6 million gallons per day (MGD) of TID supplies to the City, allowing the City to offset a portion of its existing groundwater pumping and helping the City to reduce its dependence on groundwater supplies. Should the RSWSP not go forward, the City will need to evaluate other supply alternatives to diversify its supply portfolio.

1.3.2 Anticipated Plan Benefits

This 2010 UWMP will benefit the City by providing a planning tool for treating and delivering municipal water supplies to the City's water service area. In addition, the water management elements, supply alternatives, and demand management strategies incorporated in this document will assist the City in effectively maximizing the use of available water resources.

1.4 AGENCY COORDINATION, NOTIFICATION & PARTICIPATION

Water Code § 10620 (d)(1)(2)

(d) (1) An urban water supplier may satisfy the requirements of this part by participation in area-wide, regional, watershed, or basin-wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

A variety of agency and public interests participated in the coordination and preparation of this 2010 UWMP, and are summarized in Table 1-1.

Table 1-1. Coordination with Appropriate Agencies (DWR Table 1)

Agency	Participated in UWMP Development	Notified 60 days Prior to Public Hearing	Attended Public Meetings	Sent Copy of Draft UWMP	Commented on Draft UWMP	Sent Notice of Intention to Adopt	Not Involved/ No Info.
City of Ceres Public			✓	✓	✓	✓	
City of Turlock		✓					
MID		✓					
TID		✓		✓			
City of Modesto				✓			
Stanislaus County		✓		✓			
Manufacturers Council of the Central Valley		✓					
Building Industry Association of Central California		✓					
Public Library				✓			

In accordance with the requirements of SBx7-7, Water Code section 10608.26, a public hearing was held in conjunction with the Ceres City Council meeting on March 28, 2011 to discuss the City's proposed per capita water use targets for 2015 and 2020. It was attended by the City of Ceres public.

Following completion of the Draft UWMP, a notification of public review was placed in the City's newspaper about the 2010 UWMP update process and copies of the Draft UWMP were made available at the City's Public Works Department, Library, and Community Center with an electronic version placed on the City's website. Copies of the Draft UWMP were also sent directly to key stakeholder agencies (see Table 1-1). During the public review period, various entities served by the City, as well as the general public, were encouraged to comment on the draft document.

A public hearing to discuss the Draft UWMP was held on June 27, 2011, in conjunction with the Ceres City Council meeting prior to formal adoption of the UWMP. Noticing for the public hearing was conducted pursuant to Section 6066 of the Government Code. Also, per California Water Code section 10621, notice regarding the public hearing was sent to the Stanislaus County, within which the City's water service area is located, 60 days prior to the public hearing date.

Copies of public hearing notices and notices to city and county entities associated with the City are included in Appendix C. Comments received from the stakeholders during this process are included in Appendix D.

1.5 PUBLIC PARTICIPATION

Water Code §1064

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

The City of Ceres has actively encouraged community participation in its urban water management planning efforts since the first plan was developed in 1985. Public meetings were held on the 1985, 1990, 1995, 2000 and 2005 plans. The City's public participation program includes both active and passive means of obtaining input from the community, such as public meetings.

As part of the development of this 2010 UWMP update, the City allowed a public review period following noticing and prior to adoption to allow ample time for public comments to be developed and received. Public noticing, pursuant to Section 6066 of the Government Code, was conducted prior to commencement of the public comment period. Public hearing notices are included in Appendix C of this document. During the public comment period, the Draft UWMP update was made available at the City's Public Works Department, Library, Community Center, and on the City's website. Comments received during the public comment period are included in Appendix D of this document.

1.6 CONTACT

The City (Water Supplier) is a Municipality, and is not a Bureau of Reclamation Contractor or State Water Project Contractor.

The name of the person to contact regarding this Urban Water Management Plan is:

Jeremy Damas
City of Ceres Public Works Department
Water System Superintendent
2220 Hackett Road
Ceres, CA 95307
Tel: (209) 538-5717
Fax: (209) 538-5877
Email: jeremy.damas@ci.ceres.ca.us

CHAPTER 2
Supplier Service Area

2.1 OVERVIEW

Water Code § 10631 (a), §10620 (f)

A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

§10620 (f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

The City is located in Stanislaus County in California's Central San Joaquin Valley, approximately 5 miles south of the City of Modesto, south of the Tuolumne River (see Figure 2-1). The City's existing service area is approximately 4,860 acres, or about 7.6 square miles.

2.2 SERVICE AREA

The City supplies water to nearly all residential, commercial, industrial, and institutional/governmental water users within the City limits. While the existing water service area is generally contiguous with the City limit, the northwestern portion of the City receives water service from the City of Modesto, as shown on Figure 2-2. The City also provides water service to a few customers who are outside of the current City limit. Figure 2-2 shows the City limit, the Primary and Secondary Spheres of Influence (SOIs), and areas served by the City of Modesto. The Primary and Secondary SOIs are based on the City's current General Plan, which was adopted in 1997.

2.3 WATER SYSTEM FACILITIES

This section describes water facilities to supply and deliver urban water supplies to the City's service area. The City currently depends solely on groundwater to meet its customers' water demands.

2.3.1 Surface Water Facilities

The City currently does not have any surface water supplies. However, for the future, the City is exploring the concept of importing surface water supplies to supplement the City's existing groundwater supply. The City is currently evaluating potential future participation in the proposed RSWSP supplied with water from the Turlock Irrigation District (TID).

2.3.2 Non-Potable Water Facilities

The City currently uses non-potable water pumped from irrigation wells to irrigate several of its public parks. Currently, only two City parks are currently irrigated with potable water from the City's potable water system. In the future, these parks will be supplied by non-potable irrigation wells.

2.3.3 Groundwater Facilities

Currently, the City's sole source of potable water is groundwater pumped from fifteen (15) active municipal supply wells which obtain water from the underlying Turlock Subbasin, which is part of the larger San Joaquin Valley Groundwater Basin (see Figure 2-3).

Groundwater pumped from the City's active wells is capable of producing a total of approximately 14,500 gallons per minute (gpm)[1]. However, this capacity must be reduced to account for wells that are out of service at any given time due to mechanical breakdowns, maintenance or other operational issues. For planning purposes, the City defines its firm groundwater pumping capacity assuming that the largest producing well is out of service (Well 21 Roeding Heights). The City's current firm groundwater pumping capacity is about 12,700 gpm.

Several of the City's wells have water quality concerns, and several wells are equipped with wellhead treatment systems to be able to provide a potable water supply which meets applicable drinking water standards. The City also has three (3) inactive wells which are out of service due to various water quality issues. Figure 2-4 shows the locations of the City's groundwater wells.

2.3.4 Distribution System Facilities

The City's water distribution system consists of a single pressure zone with an average ground surface elevation of approximately 95 feet above mean sea level. The City has approximately 140 miles of water system pipelines. There are two at-grade reservoirs with a combined storage capacity of 3.8 million gallons (MG) that currently serve the City. The reservoirs have an associated booster pump station to pump water from the reservoirs into the distribution system. During periods of high demand, water is pumped from the tanks into the distribution system to supplement the well supplies. The tanks have a pressure sustaining valve that opens to allow replenishment of the tanks during lower demand periods when well capacity is available.

2.4 CLIMATE

Water use within the City's service area is dependent on various climate factors such as temperature, precipitation, and evapotranspiration (ET). Climate data, including temperature and precipitation estimates, were obtained from the Western Regional Climate Center for the City service area. The period of record is March 1, 1906 to July 31, 2010.

[1] Based on the total combined flow rates of active wells during summer 2010 pump efficiency testing.

ET is a term used to describe water lost through evaporation from the soil and surface water bodies, combined with plant transpiration. In general, the reference ET_o is given for turf grass, and then corrected for a specific crop type. Local ET_o data was obtained from California Irrigation Management Information System (CIMIS) Station #71, located west of Modesto and operated by the Department of Water Resource (DWR).

The City has a Mediterranean climate with hot and dry summers, and cool winters (Table 2-1). Annual precipitation averages approximately thirteen inches, and the area is subject to droughts. Deviation from the average annual precipitation was experienced in 1997/98 due to the El Nino conditions when considerably more precipitation than average occurred, and the last drought period extended from 1987 to 1992.

Table 2-1 shows the historic climate characteristics affecting water management in the City service area.

Table 2-1. City of Ceres Climate

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Monthly Average ET_o[(a)], in	0.87	1.71	3.43	5.24	6.70	7.40	7.85	6.75	4.93	3.37	1.66	0.87	50.78
Average Total Precipitation[(b)], in	2.47	2.08	1.91	1.03	0.46	0.12	0.02	0.04	0.18	0.63	1.23	2.06	12.22
Average Max Temperature[(b)], °F	53.8	60.9	67.0	73.3	81.2	88.4	94.3	92.2	87.6	77.9	64.6	54.3	74.6
Average Min Temperature[(b)], °F	37.6	40.8	43.5	46.8	51.8	56.6	59.9	58.8	55.9	49.5	41.7	37.7	48.4

(a) Data from CIMIS Station #71 (http://wwwcimis.water.ca.gov/cimis/monthlylyEToReport). DWR requests that information be based on the last 30 years; however, the CIMIS information for this station is available only from June 1987 to the present.
(b) Data from Western Regional Climate Center (http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca5738) for Modesto, California. Period of record is March 1, 1906 to July 31, 2010.

Other climate characteristics that affect water management in the City service area include solar radiation, relative humidity, dew point, wind speed, and soil temperature. Daily and monthly averages for these values can be obtained from the CIMIS station website at: http://wwwcimis.water.ca.gov/.

2.5 OTHER DEMOGRAPHIC FACTORS

No other demographic factors affecting water use in the City have been identified at this time. If additional demographic factors are identified, these will be addressed in subsequent updates to this 2010 UWMP.

2.6 SERVICE AREA POPULATION

The City has a current population of approximately 42,000. The historical annual population of the City, shown in Table 2-2, was obtained from the California Department of Finance (DOF), Table E-5, City/County Population and Housing estimates. The water service area excludes small areas in the northwest and northern parts of the City that are served by the City of Modesto. To

determine the City's actual water service area population, the DOF population estimates were adjusted based on dwelling unit counts and average person per household densities reported by the DOF to exclude the population within the City's city limit that is served by the City of Modesto. It is estimated that about 1,200 people are served by the City of Modesto. As shown in Table 2-2, the population of the City water service area has increased from about 25,300 in 1990 to 42,000 in 2010, representing approximately a 70 percent increase over the past twenty years. Over the past ten years, population increased from 33,900 in 2001 to approximately 42,000 in 2010, representing approximately a 25 percent increase. This increase in population is mainly the result of development occurring in the eastern and southwestern portions of the City.

Table 2-2. City of Ceres Historical Service Area Population

Year	DOF Population[(a)]	Service Area Population	Persons/Household[(a)]
1990	26,413	25,298	3.039
1991	27,616	26,507	3.022
1992	28,678	27,547	3.081
1993	29,795	28,650	3.121
1994	30,382	29,234	3.128
1995	31,371	30,203	3.183
1996	32,055	30,882	3.195
1997	32,768	31,587	3.219
1998	33,398	32,208	3.244
1999	33,801	32,601	3.270
2000	34,609	33,395	3.307
2001	35,111	33,885	3.341
2002	35,805	34,570	3.364
2003	36,519	35,277	3.384
2004	37,473	36,231	3.385
2005	38,712	37,479	3.360
2006	40,719	39,502	3.317
2007	41,678	40,470	3.292
2008	42,491	41,282	3.295
2009	42,888	41,678	3.298
2010	43,219	42,001	3.320

[(a)] Historical population estimates obtained from State of California, Department of Finance, E-5, Population and Housing Estimates for Cities, Counties and the State, 2001-2010, with 2000 Benchmark. Sacramento, California, May 2010. Estimates are as of January 1st in each listed year. Service Area population was estimated by excluding homes in North Ceres that are served by the City of Modesto.

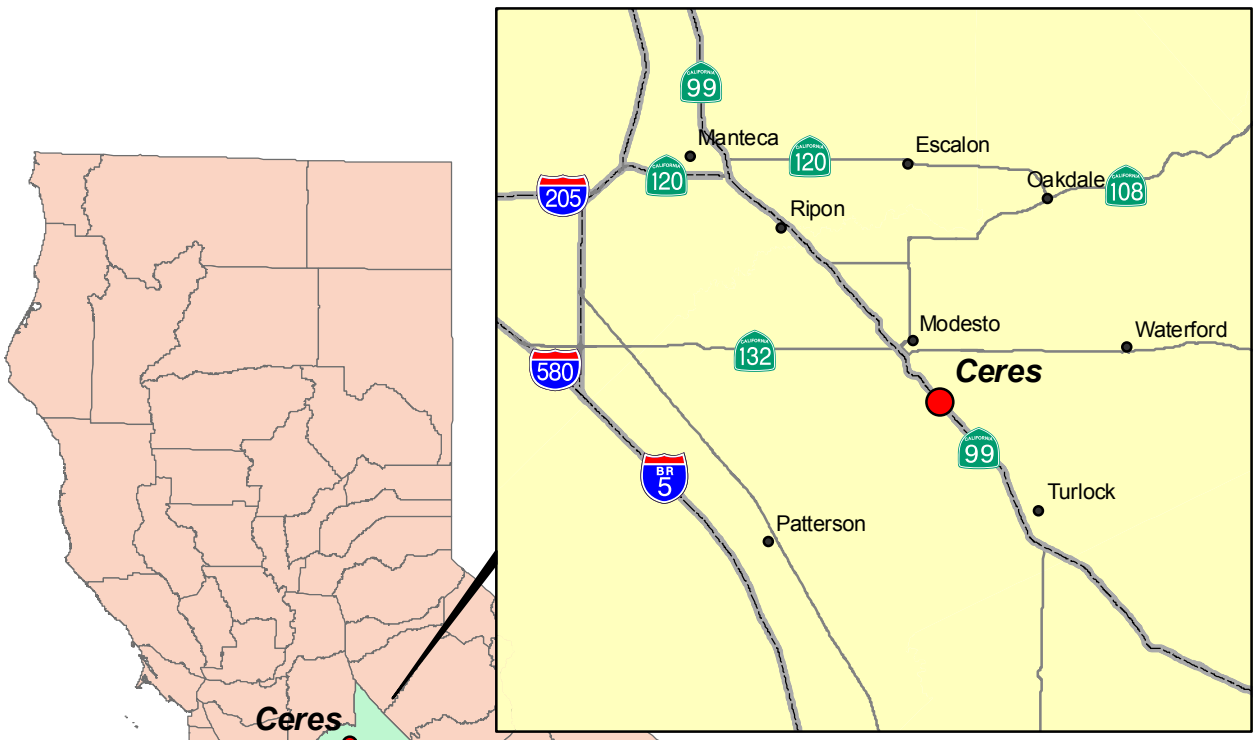
Future population projections, shown in Table 2-3, were estimated using projected land use development assumptions from the City's Water Master Plan, assuming future development at densities similar to historical development, and current persons/household estimates from the DOF. The population of the City's service area in 2035 is estimated to be about 96,100.

Table 2-3. Population Served by the City of Ceres - Current and Projected[(a)] (DWR Table 2)

Year	Population
2010	42,001
2015	43,600
2020	56,725
2025	69,850
2030	82,975
2035	96,100

(a) Calculated based on future developed land use within the Study Area, assuming continuation of development at historical densities, and using current DOF estimates of persons/household. The Study Area, shown on Figure 2-2, includes areas within the Primary and Secondary SOI's, as well as areas designated in the General Plan, but currently outside of the SOI's.

O:\Clients\341 City of Ceres\02-10-10 Ceres Urban Water Mngt Plan\GIS\Figures\2010 UWMP\Fig2-1_Ceres_Vicinity_Map.mxd 3/10/2011



LEGEND

- City of Ceres
- Stanislaus County
- California Counties

N

0 50 100

Scale in Miles

FIGURE 2-1

City of Ceres
2010 UWMP Update

CITY OF CERES VICINITY MAP

WEST YOST ASSOCIATES
Consulting Engineers

FIGURE 2-2

City of Ceres
2010 UWMP Update

WATER SERVICE AREAS

Notes

1. SOI and Study Area boundary files provided by ECO:LOGIC on 05/04/10. Boundaries have been revised to exclude area served by City of Modesto.
2. Existing City Limits file (Ctylmt01.dwg) provided by the City on 10/01/09.

LEGEND

- City Limits
- Primary SOI
- Secondary SOI
- Area Served by City of Modesto
- Street

CITY OF CERES — TOGETHER WE ACHIEVE

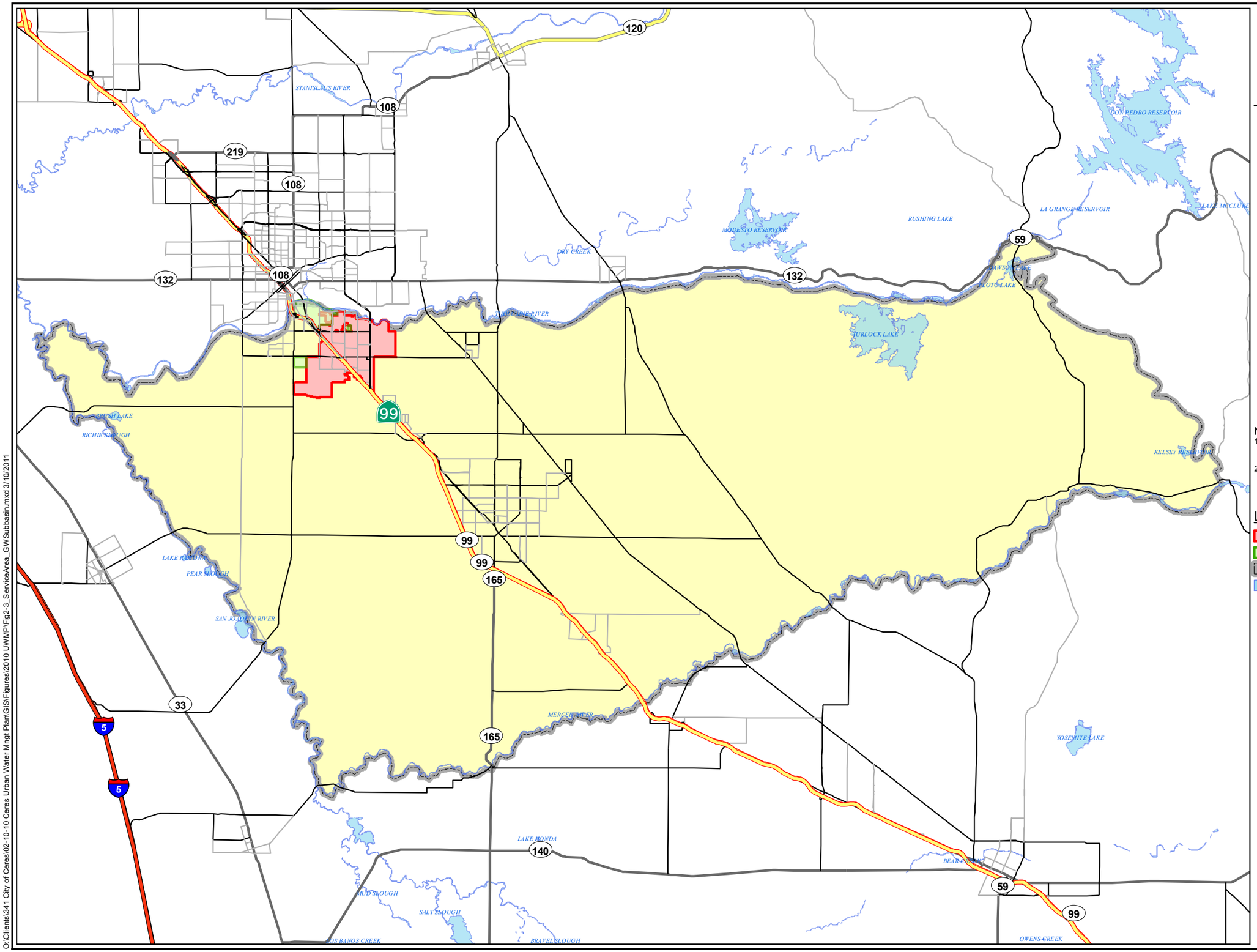
WEST YOST ASSOCIATES — Consulting Engineers

O:\Clients\341 City of Ceres\02-10-10 Ceres Urban Water Mngt Plan\GIS\Figures\2010 UWMP\Fig2-2_ServiceArea.mxd 3/10/2011

FIGURE 2-3

City of Ceres
2010 UWMP Update

WATER SERVICE AREAS AND LOCATION OF GROUNDWATER SUBBASIN



O:\Clients\341 City of Ceres\02-10-10 Ceres Urban Water Mngt Plan\GIS\Figures\2010 UWMP\Fig2-3_ServiceArea_GWSubbasin.mxd 3/10/2011

0 9,650 19,300

Scale in Feet

Notes

1. SOI and Study Area boundary files provided by ECO:LOGIC on 05/04/10. Boundaries have been revised to exclude area served by City of Modesto.
2. Existing City Limits file (Ctylmt01.dwg) provided by the City on 10/01/09.

LEGEND

- City Limits
- Area Served by City of Modesto
- Turlock Groundwater Subbasin
- Water Features

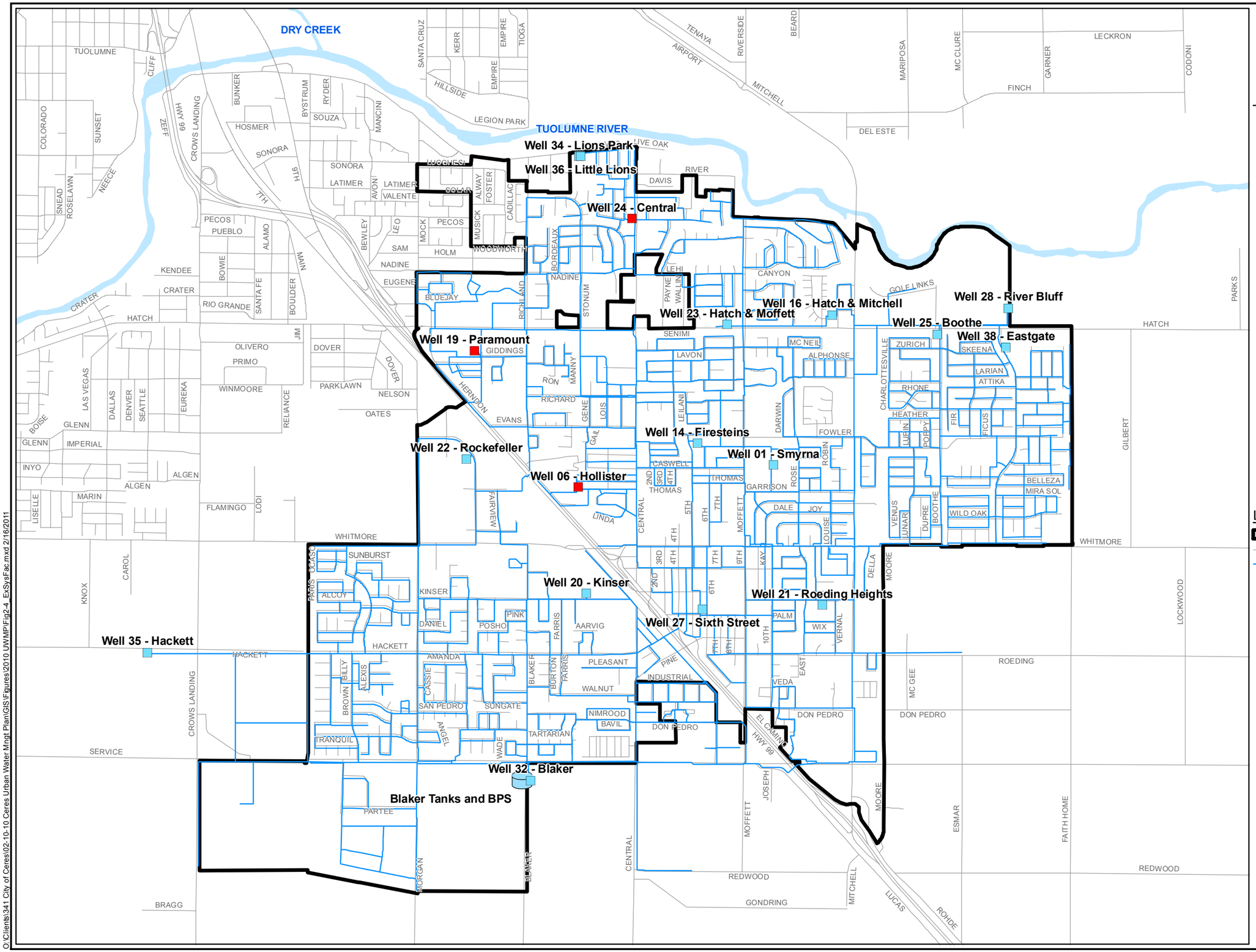
CITY OF CERES — TOGETHER WE ACHIEVE

WEST YOST ASSOCIATES — Consulting Engineers

FIGURE 2-4

City of Ceres
2010 UWMP Update

WATER SERVICE AREA FACILITIES



0 1,125 2,250
Scale in Feet

N

LEGEND

- City Limit
- Street
- Pipeline
- Existing Well
- Inactive Well
- Existing Tank and Booster Pump Station

CITY OF CERES — TOGETHER WE ACHIEVE

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\341 City of Ceres\02-10-10 Ceres Urban Water Mngt Plan\GIS\Figures\2010 UWMP\Fig2-4_ExSysFac.mxd 2/16/2011

CHAPTER 3
Water Supply

3.1 WATER SUPPLY OVERVIEW

This chapter describes the sources of water available to the City. The chapter includes a description of each water source, including limitations, water quality, and water exchange opportunities.

As described in *Chapter 2 Supplier Service Area*, the City relies exclusively on groundwater to meet current water demands. However, to increase the reliability and diversity of the City's future water supplies, the City is considering participation in surface water supply projects.

3.2 GROUNDWATER

Water Code §10631 (b)(1-4)

A plan shall be adopted in accordance with this chapter and shall do all of the following:

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.

For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

The City has historically relied on groundwater from the San Joaquin Valley Groundwater Basin as its sole source of supply. The local groundwater source for the City is the Turlock Subbasin (DWR Basin Number 5-22.03), which is a sub-unit of the San Joaquin Valley Groundwater Basin (DWR Basin Number 5-22)[1]. The Turlock Subbasin lies in the eastern portions of Stanislaus and Merced counties and has an aerial extent of approximately 347,000 acres. The

[1] California Department of Water Resources, Bulletin 118, California's Groundwater, Groundwater Basin Descriptions, San Joaquin Valley Groundwater Basin—Turlock Subbasin, last updated January 20, 2006.

Turlock Subbasin is not adjudicated. A complete description of the Turlock Subbasin is provided in the Groundwater Management Plan in Appendix E.

Groundwater is pumped from fifteen active wells located throughout the City's water service area. The wells pump directly into the distribution system. Historical groundwater pumping from 1980 through 2010 is shown in Figure 3-1. Since 1980, the City's groundwater production has increased from approximately 3,300 acre feet per year (AFY) to approximately 10,000 AFY. However, based on the groundwater pumping over the last 10 years shown in Table 3-1 below, groundwater production by the City has been relatively constant and averaged approximately 10,000 AFY.

Table 3-1. Amount of Groundwater Pumped from Turlock Subbasin, AFY (DWR Table 18)[(a)]

Year	Amount Pumped
2001	9,451
2002	10,067
2003	9,748
2004	10,141
2005	10,140
2006	10,125
2007	10,823
2008	10,613
2009	9,193
2010	8,284
10-year Average	9,859

(a) Based on records obtained from the City.

As discussed in *Chapter 2 Supplier Service Area*, the City also uses non-potable water pumped from shallow irrigation wells to irrigate several of its public parks. This non-potable groundwater pumpage is not included in the City's municipal groundwater pumpage quantity listed in Table 3-1. The City accounts for only about 23 percent of the municipal groundwater pumpage within the Turlock Subbasin, and only about 2 percent of the total groundwater pumpage within the Subbasin.

A groundwater basin's sustainable or "safe yield" is defined as the average annual amount of groundwater that can be extracted from the groundwater basin, while maintaining a non-overdraft condition. The sustainable yield of the Turlock Subbasin is currently unknown. DWR's report titled *California's Groundwater* (also referred to as Bulletin 118) describes groundwater basins and subbasins throughout the State, and includes information on groundwater level trends (where available). According to Bulletin 118, the groundwater levels in the Turlock Subbasin rose about seven feet from 1994 to 2000[2]. The rising water levels suggest

[2] Turlock subbasin description: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/5-22.03.pdf; accessed January 24, 2011.

that the current level of pumping in the Subbasin is less than or equal to the "safe yield" of the Subbasin. The DWR has not identified the Turlock Subbasin as being "overdrafted." Moreover, the Tuolumne River has gone from a "losing" river to a "gaining" river in the period from 1960 to 2005, which could be a further indication that groundwater operations in the Turlock Subbasin are generally in balance with groundwater recharge. Groundwater pumpage by the municipalities located within the Turlock Subbasin makes up a very small percentage (less than 10 percent) of the total pumpage from the Turlock Subbasin. As mentioned previously, pumpage by the City accounts for only about 2 percent of the total annual pumpage in the Turlock Subbasin.

The City has also implemented a groundwater level monitoring program which involves measuring groundwater levels on a monthly basis in many of the City's wells. Based on this data, in the last 10 years, water levels in the City's wells appear to have remained relatively stable.

As such, the City's current average annual groundwater production of approximately 10,000 AFY appears to be sustainable into the future. However, if the City's groundwater pumpage were to significantly increase in the future, it is unclear what the impacts to the Turlock Subbasin would be. The City's groundwater level monitoring program will be an important tool to track and monitor groundwater levels (and subsequent changes in groundwater basin storage) into the future.

The biggest threat to the City's continued and/or increased use of groundwater to meet potable water demands is water quality. The City's firm groundwater pumping capacity is approximately 12,700 gpm. Approximately 5,400 gpm of this total capacity is groundwater that is currently treated or blended. This treated groundwater represents about 43 percent of the City's current firm groundwater pumping capacity. If groundwater levels begin to decline as a result of increased groundwater pumpage, existing groundwater gradients and flow directions will be impacted, possibly impacting the direction and gradient of existing groundwater contaminant plumes.

A summary of the water quality concerns and pumping rates of the City's wells is provided in Table 3-2. Specific contaminants of concern for the City are nitrate, uranium, arsenic, manganese, and specific conductance. As shown in Table 3-3, nearly all of the City's active wells are impacted by a combination of inorganic contaminants, with the exception of Well 28 which is currently used as a blending source for Well 25, and the City's newest wells (Wells 34, 35, 36 and 38).

Implementation of treatment alternatives, such as increased blending, could serve to firm up the groundwater production capacity, and could possibly allow wells that are currently out of service to be returned to active status to increase the City's firm groundwater pumping capacity. The City may also need to add wellhead treatment to additional wells if contaminant levels increase over time and/or additional wells are impacted. In the future, as the City looks to replace older wells and/or install new wells, careful evaluation of future well sites and well construction details must made to minimize the need for wellhead treatment.

Table 3-2. Groundwater Well Pumping Rate and Water Quality Concerns[a]

Well No.	Pumping Rate, gpm	Depth to Static Water, ft	Depth to Pumping Water, ft	Water Quality Concerns
1	410	63	N/A	Uranium and nitrate; Sand production. Well is blended with system water.
6	N/A	40	N/A	Nitrate (as NO_3) exceeding MCL. Well is currently out of service.
14	155	79.5	95	None.
16	194	80.1	117	None.
19	N/A	46	N/A	Uranium and manganese exceeding MCL; Sand production. Well is currently out of service.
20	1,300	75	93	Sand production.
21	1,528	91	126	None.
22	1,394	65	124	Uranium and sand production. Well has ion exchange treatment.
23	1,330	86	145	None.
24	N/A	72	N/A	Specific conductance and manganese exceeding MCL. Well is currently out of service.
25	510	69.5	82	Uranium and nitrate. Well is blended with Well 28.
27	1,230	76	98	None.
28	1,134	93	154	None.
32	1,311	99	157	Arsenic and manganese. Well has coagulation/oxidation/filtration treatment.
34	547	N/A	N/A	None.
35	642	38.4	82	None.
36	330	70.9	77	None.
38	1,150	72	126	None.

[a] Data obtained from Wood Rodgers' City of Ceres Well Field and Hydrogeologic Assessment Report (July 2010).

Table 3-3. Summary of Water Quality Concerns in City of Ceres Wells

	City Well Number																	
	1	6	14	16	19	20	21	22	23	24	25	27	28	32	34[a]	35[a]	36[a]	38[a]
Nitrate																		
Uranium																		
Arsenic																		
Manganese																		
Specific Conductance																		
Treatment Type[b]	B	OS			OS			IX		OS	B		B	C/Ox/F				

Legend:
Red box indicates the 95th percentile of historical data is above the MCL for the constituent shown.
Blue box indicates that the 95th percentile is above the water quality goal (80% of the MCL).

(a) Wells 34, 35, 36 and 38 are the City's newest wells, all constructed within the last two years. 2009 water quality sampling for Wells 34, 35, 36 and 38 indicate that water produced from these wells meets all the CDPH primary and secondary drinking water quality standards.

(b) Treatment Types: B = Blending; IX = Ion Exchange; C/Ox/F = Coagulation/Oxidation/Filtration; OS = Out of Service

Table 3-4 presents the City's current and projected future groundwater pumping.

Table 3-4. Amount of Groundwater Projected to be Pumped in the City of Ceres – Normal Average Annual Demands (DWR Table 19)

Basin Name	2010 (actual)	2015	2020	2025	2030	2035
Turlock Subbasin Total, AFY[(a)]	8,284	10,700	5,600	8,100	10,600	13,100
% of Total City Supply	100%	100%	46%	55%	61%	66%

[(a)] Assumes that the City participates in 6 MGD of RSWSP by 2018.

The City is also considering diversifying its water supply alternatives by exploring additional surface water supplies to offset groundwater pumping. The City is evaluating potential participation in the RSWSP, which would provide treated surface water using water supplied by TID to areas south of the Tuolumne River. Participation in the RSWSP will allow the City to optimize its water supplies to best meet demands under a range of hydrologic conditions.

3.2.1 Groundwater Management Plan

The City participated in the preparation of the *Turlock Groundwater Basin Management Plan* (Plan). The Plan was prepared by the Turlock Groundwater Basin Association and was completed in 2008. Other agencies involved in this association include the City of Turlock, TID, City of Modesto, City of Hughson, Merced Irrigation District, Eastside Water District, Delhi County Water District, Ballico Community Services District, Ballico-Cortez Water District, Hillmar Water District, Denair Community Services District, the Keyes Community Water District, Stanislaus County and Merced County.

A Copy of the Turlock Subbasin groundwater management plan is provided in Appendix E.

As described above, the City currently uses only groundwater to meet its current demands. Additional future surface water supplies provided from the RSWSP will provide the City with the opportunity to diversify its supplies.

3.3 WHOLESALE SUPPLIES

Water Code §10631 (k)

A plan shall be adopted in accordance with this chapter and shall do all of the following:

(k) Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

The City does not currently purchase any wholesale surface water supply. However, the City is currently pursuing the option of participating in the RSWSP to provide an additional supply source for its customers, which would use wholesale surface water supply provided by TID. The City is evaluating future delivery of 6,700 AFY (6 MGD) of RSWSP surface water. This would enhance the City's water supply reliability. The City's demand for potential wholesale supplies from TID is shown in Table 3-5.

Table 3-5. City of Ceres Demand Projections Provided to TID, AFY (DWR Table 12)

Wholesaler	Potential Contracted Volume	2010 (actual)	2015	2020	2025	2030	2035
TID[(a)]	6,700	0	0	6,700	6,700	6,700	6,700
% of Total Supply		0%	0%	54%	45%	39%	34%

[(a)] Assumes that the City participates in 6 MGD of RSWSP by 2018.

3.4 EXCHANGE OR TRANSFER OPPORTUNITIES

Water Code §10631 (d)

A plan shall be adopted in accordance with this chapter and shall do all of the following:
(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

The City is not currently exploring any exchange or transfer opportunities. The City resides within the service area of TID. TID provides water from the Tuolumne River to more than 5,800 growers in the Stanislaus County. Should it become necessary to supply additional water to the City, the City could pursue transfer or purchase opportunities with TID. The City's potential transfer and exchange opportunities are shown in Table 3-6, below.

Table 3-6. City of Ceres Transfer and Exchange Opportunities (DWR Table 20)

Transfer Agency	Transfer or Exchange	Short term	Proposed Quantities	Long term	Proposed Quantities
Turlock Irrigation District	Transfer or Exchange	No	N/A	Yes	TBD
Total			N/A		TBD

TBD = To Be Determined

3.5 DESALINATED WATER

Water Code §10631 (i)

A plan shall be adopted in accordance with this chapter and shall do all of the following:

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

Due to the significant infrastructure investment required to convey seawater for desalination, the lack of proximate brackish supply sources, and the depth to saline groundwater, desalination is currently not a viable water supply option for the City.

3.6 SUMMARY OF CURRENT AND FUTURE WATER SUPPLIES

Water Code § 10631 (b)

A plan shall be adopted in accordance with this chapter and shall do all of the following:

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.

For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

Table 3-7 summarizes the current and projected future water supplies for the City. Future water purchases from TID are projected to occur by 2018, coinciding with completion of the RSWSP.

Table 3-7. City of Ceres Current and Planned Water Supplies, AFY (DWR Tables 16 and 17)

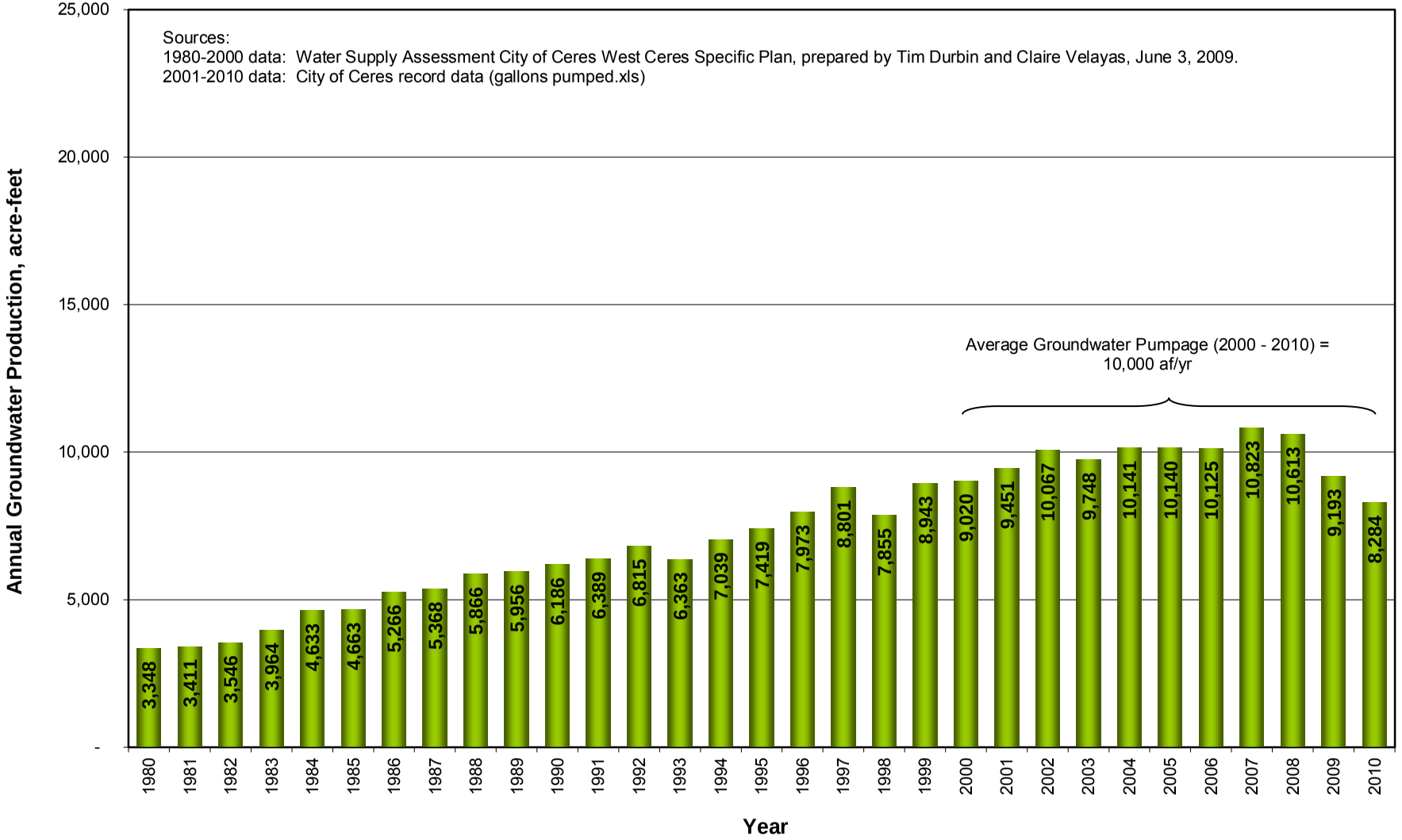
Supply	2010 (actual)	2015	2020	2025	2030	2035
Wholesale Water Providers						
Turlock Irrigation District[a]	0	0	6,700	6,700	6,700	6,700
City produced groundwater	8,284	10,700	5,600	8,100	10,600	13,000
Transfers in or out	0	0	0	0	0	0
Exchanges In or out	0	0	0	0	0	0
Recycled Water (projected use)	0	0	0	0	0	0
Desalination	0	0	0	0	0	0
Other	0	0	0	0	0	0
Total[b]	8,284	10,700	12,300	14,800	17,300	19,800

[a] Once the RSWSP is operational, anticipated by 2018, an additional 6,700 AFY of demand will be met with surface water supplies. The RSWSP is expected to offset some of the City's existing groundwater pumping.
[b] Future demand for the City's Water Service area is based on current projections developed in this UWMP. Projections incorporate anticipated conservation reductions to comply with SBx7-7.

The City's future water supply planning incorporates the conjunctive use of surface water and groundwater supplies. This would diversify the City's water supply portfolio and improve the overall reliability and water quality of the City's water supplies. Incorporating surface water supply would also reduce the City's reliance on groundwater and allow the City to minimize its use of groundwater, thus helping to maintain and protect the City's groundwater resource.

The reliability and vulnerability of the City's water supplies under various hydrologic conditions is described in Chapter 6.

Figure 3-1. City of Ceres Historical Annual Groundwater Production



CHAPTER 4
Water Demand

4.1 OVERVIEW OF WATER USE

As described in Chapter 2, the City's water service area is generally contiguous with the City limit; however, the northwest portion of the City receives water service from the City of Modesto. The City also provides water service for a few customers who are outside of the current City limit, but are within the Primary SOI.

Since 1992, water meters have been installed on all new residential units; however, the meters at these residential units have not been regularly read nor billed on a use basis. These residential units have continued to be billed at a flat rate. Also, most existing single family residential water connections (pre-1992) are traditionally not metered and are also billed at a flat rate. Water use for the majority of the remaining multi-family housing, commercial, industrial, and institutional/governmental facilities is metered.

In early 2010, the City developed and began a meter retrofit/installation project to convert all existing flat rate residential customers to metered connection, and subsequent billing based on use. The City is anticipating completion of the meter retrofit/installation project by approximately April/May 2011, and will be implementing a new metered rate structure by early 2012 that will encourage conserving behavior by incorporating a baseline volumetric charge in addition to the fixed meter charge for residential meters (water use beyond the baseline quantity will eventually be billed at a higher unit rate). The new meters will also be supplemented with Automatic Meter Infrastructure (AMI) software and equipment to provide the City with instantaneous and efficient data acquisition capability.

4.2 PAST AND CURRENT WATER USE BY WATER USE SECTOR

Water Code §10631 (e)(1)(2)

(e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

Actual water use by the City's customers, by water use sector, in 2005 is summarized in Table 4-1.

Table 4-1. Water Deliveries—Actual (2005) (DWR Table 3)

Water Use Sectors	2005				
	Metered		Non Metered		Total Deliveries, AFY
	# of Services[(a)]	Deliveries, AFY[(a)]	# of Services[(a)]	Deliveries, AFY[(a)]	
Single Family	8	4	9,343	6,140	6,144
Multi-Family	150	733	216	1,432	2,165
Commercial	274	580	92	240	820
Industrial	94	120	9	10	130
Institutional/Governmental	0	0	0	0	0
Landscape	128	470	2	10	480
Agriculture	0	0	0	0	0
Other	0	0	0	0	0
Total[(b)]	654	1,907	9,662	7,832	9,739

(a) Source: Urban Water Management Plan Conformed with February 2008 Addendum (July 2008), ECO:LOGIC.
(b) Does not include unaccounted for water.

Actual water use by the City's customers, by water use sector, in 2010 is summarized in Table 4-2.

Table 4-2. Water Deliveries—Actual (2010) (DWR Table 4)

Water Use Sectors	2010				
	Metered		Non Metered		Total Deliveries, AFY
	# of Services[a,b]	Deliveries, AFY[c]	# of Services	Deliveries, AFY	
Single Family	10,208	4,225	0	0	4,225
Multi-Family	410	1,408	0	0	1,408
Commercial	317	704	0	0	704
Industrial	107	70	0	0	70
Institutional/Governmental	62	282	0	0	282
Landscape	159	352	0	0	352
Agriculture	0	0	0	0	0
Other	0	0	0	0	0
Total[d]	11,263	7,041	0	0	7,041

[a] Number of services estimated based on (1) total number of services provided by City staff on May 4, 2010, (2) data provided from 2006, 2007, and 2008 meters in the *ConsumptionExport (3Yr ALL).xls* file provided by City staff on April 2, 2010, and (3) 2005 data presented in the Urban Water Management Plan Conformed with February 2008 Addendum (July 2008) prepared by ECO:LOGIC.

[b] The City is anticipating completion of the meter retrofit/installation project by approximately April/May 2011, and will be implementing a new metered rate structure by September 2011. An accurate count of non-metered services was not available as most of the flat rate services were converted to metered services in 2010; therefore, all accounts were assumed to be metered and deliveries were estimated (see footnote (c)).

[c] Actual metered deliveries for 2010 water use were not available; values shown represent a proportionate split in water use by sector (based on data provided from 2006, 2007, and 2008 meters in the *ConsumptionExport (3Yr ALL).xls* file provided by City staff on April 2, 2010, and 2005 data presented in the Urban Water Management Plan Conformed with February 2008 Addendum (July 2008) prepared by ECO:LOGIC) and the total water production that occurred in 2010.

[d] Does not include unaccounted for water.

4.3 PROJECTED WATER USE BY WATER USE SECTOR

Projected water use by the City's customers, by water use sector, in 2015 is summarized in Table 4-3.

Table 4-3. Water Deliveries—Projected (2015) (DWR Table 5)

Water Use Sectors	2015				
	Metered		Non Metered		Total Deliveries, AFY
	# of Services[a]	Deliveries, AFY[b]	# of Services	Deliveries, AFY	
Single Family	10,544	4,741	0	0	4,741
Multi-Family	436	1,520	0	0	1,520
Commercial	450	1,170	0	0	1,170
Industrial	138	803	0	0	803
Institutional/Governmental	63	493	0	0	493
Landscape[c]	165	365	0	0	365
Agriculture	0	0	0	0	0
Other	0	0	0	0	0
Total[d]	11,796	9,092	0	0	9,092

[a] Number of services projected based on the projected percent annual increase in land use acreage with potable water use within each water use sector; however, landscape services were projected based on the average projected percent annual increase in land use acreage with potable water use between all water use sectors excluding single family.
[b] Deliveries by water use sector based on projected potable water demands using land use data and adjusted to account for water conservation to meet SBx7-7 requirements and for the projected landscape water deliveries (see footnote (c)).
[c] Land use based water demand projections for landscape services were not available; therefore, deliveries to landscape services were estimated based on the projected number of services and a water use factor of approximately 2.2 AFY/service.
[d] Does not include unaccounted for water.

Projected water use by the City's customers, by water use sector, in 2020 is summarized in Table 4-4.

Table 4-4. Water Deliveries—Projected (2020) (DWR Table 6)

Water Use Sectors	2020				
	Metered		Non Metered		Total Deliveries, AFY
	# of Services[a]	Deliveries, AFY[b]	# of Services	Deliveries, AFY	
Single Family	13,884	6,108	0	0	6,108
Multi-Family	476	1,611	0	0	1,611
Commercial	515	1,312	0	0	1,312
Industrial	188	1,081	0	0	1,081
Institutional/Governmental	73	550	0	0	550
Landscape[c]	195	432	0	0	432
Agriculture	0	0	0	0	0
Other	0	0	0	0	0
Total[d]	15,331	11,094	0	0	11,094

(a) Number of services projected based on the projected percent annual increase in land use acreage with potable water use within each water use sector; however, landscape services were projected based on the average projected percent annual increase in land use acreage with potable water use between all water use sectors excluding single family.
(b) Deliveries by water use sector based on projected potable water demands using land use data and adjusted to account for water conservation to meet SBx7-7 requirements and for the projected landscape water deliveries (see footnote (c)).
(c) Land use based water demand projections for landscape services were not available; therefore, deliveries to landscape services were estimated based on the projected number of services and a water use factor of approximately 2.2 AFY/service.
(d) Does not include unaccounted for water.

Projected water use by the City's customers, by water use sector, in 2025, 2030 and 2035 is summarized in Table 4-5.

**Table 4-5. Water Deliveries—Projected (2025, 2030 and 2035)
(DWR Table 7)**

Water Use Sectors	Metered					
	2025		2030		2035	
	# of Services[(a)]	Deliveries, AFY[(b)]	# of Services[(a)]	Deliveries, AFY[(b)]	# of Services[(a)]	Deliveries, AFY[(b)]
Single Family	17,224	7,586	20,564	9,064	23,904	10,543
Multi-Family	516	1,736	556	1,860	596	1,984
Commercial	580	1,484	645	1,655	710	1,827
Industrial	238	1,393	288	1,706	338	2,019
Institutional/Governmental	83	625	93	699	103	773
Landscape[(c)]	225	498	255	565	285	631
Agriculture	0	0	0	0	0	0
Other	0	0	0	0	0	0
Total[(d)]	18,866	13,322	22,401	15,549	25,936	17,777

(a) Number of services projected based on the projected percent annual increase in land use acreage with potable water use within each water use sector; however, landscape services were projected based on the average projected percent annual increase in land use acreage with potable water use between all water use sectors excluding single family.
(b) Deliveries by water use sector based on projected potable water demands using land use data and adjusted to account for water conservation to meet SBx7-7 requirements and for the projected landscape water deliveries (see footnote (c)).
(c) Land use based water demand projections for landscape services were not available; therefore, deliveries to landscape services were estimated based on the projected number of services and a water use factor of approximately 2.2 AFY/service.
(d) Does not include unaccounted for water.

On October 7, 2005, SB 1087 was signed into law, requiring public agencies and private entities providing water or sewer services to grant priority for those services to proposed developments that include housing units for lower income households (Government Code Section 65589.7).

Based on information provided by City staff[1], approximately 3 percent of the City's single family residential units are affordable housing units and approximately 21 percent of the multi-family residential units are affordable housing units. For purposes of this 2010 UWMP, it is assumed that 3 percent of future single family water use and 21 percent of future multi-family water use will be from affordable housing units.

[1] Source: Email sent by City staff on March 3, 2011.

Projected water use by the City's low income customers is summarized in Table 4-6.

Table 4-6. Low Income Projected Water Demands (DWR Table 8)

Low Income Water Demands	2015	2020	2025	2030	2035
Single Family Residential[(a)], AFY	142	183	228	272	316
Multi-Family Residential[(b)], AFY	319	338	365	391	417
Total	461	521	593	663	733

(a) Based on 3 percent of the projected future single family residential water demand.
(b) Based on 21 percent of the projected future multi-family residential water demand.

4.4 SALES TO OTHER AGENCIES

The City does not currently sell water to other agencies, as shown in Table 4-7.

Table 4-7. Sales to Other Agencies, AFY (DWR Table 9)

Water Distributed	2010 (actual)	2015	2020	2025	2030	2035
None	0	0	0	0	0	0
Total	0	0	0	0	0	0

4.5 ADDITIONAL WATER USES AND LOSSES

Additional water uses include such uses as saline barriers and groundwater recharge. The City does not currently use water for such uses. Water losses occur due to distribution system leaks and other unmetered water uses (such as firefighting, main flushing, etc.). Actual water losses within the City's water system cannot be confirmed until the City has completed its current efforts to implement metering City-wide. Therefore, for the purposes of this 2010 UWMP Update, unaccounted for water and system losses are assumed to comprise approximately 15 percent of total production. This assumption is intended to provide a conservative estimate of water losses throughout the City's distribution system. However, taking into account the anticipated completion of the City's meter retrofit/installation project in April/May 2011, unaccounted for water and system losses are assumed to decrease from 15 percent to 10 percent after 2015 to account for improved leak detection and repair when the City is fully metered. Once the City completes its meter retrofit/installation project (anticipated by April/May 2011), actual water losses can be determined. Estimates of unaccounted-for system losses are documented in Table 4-8.

Table 4-8. Additional Water Uses and Losses, AFY (DWR Table 10)

Water Use	2010 (actual)	2015	2020	2025	2030	2035
Saline Barriers	0	0	0	0	0	0
Groundwater Recharge	0	0	0	0	0	0
Conjunctive Use	0	0	0	0	0	0
Raw Water	0	0	0	0	0	0
Recycled Water	0	0	0	0	0	0
System losses[a,b]	1,243	1,604	1,233	1,480	1,728	1,975
Total	1,243	1,604	1,233	1,480	1,728	1,975

[a] Unaccounted for system losses are estimated to be 15 percent of total production for 2010 to 2015. After 2015, it is assumed that unaccounted for system losses will decrease to 10 percent to account for improved leak detection and repair when the City is fully metered.
[b] System losses may include leaks, flushing, fires, flow testing, backflushing, etc.

Table 4-9 summarizes the current and projected total water demands for the City's service area through the year 2035. These future total water demands are consistent with the City's SBx7-7 required per capita water use targets for 2015 (interim target of 219 gpcd) and for 2020 and beyond (final target of 194 gpcd).

Table 4-9. Total Water Use, AFY (DWR Table 11)

Water Use	2010 (actual)	2015	2020	2025	2030	2035
Total Water Deliveries	7,041	9,092	11,094	13,322	15,549	17,777
Sales to Other Water Agencies	0	0	0	0	0	0
Additional Water Uses and Losses[a]	1,243	1,604	1,233	1,480	1,728	1,975
Total[b]	8,284	10,700 [c]	12,300 [d]	14,800	17,300	19,800

[a] Unaccounted for system losses are estimated to be 15 percent of total production for 2010 to 2015. After 2015, it is assumed that unaccounted for system losses will decrease to 10 percent to account for improved leak detection and repair when the City is fully metered.
[b] Total rounded to the nearest 100.
[c] Consistent with City's interim gpcd target of 219 gpcd per SBx7-7 (219 gpcd x 43,600 service area population = 10,700 AFY).
[d] Consistent with City's final gpcd target of 194 gpcd per SBx7-7 (194 gpcd x 56,725 service area population = 12,300 AFY).

4.6 RETAIL AGENCY DEMAND PROJECTIONS PROVIDED TO WHOLESALE SUPPLIERS

The City is not currently provided with urban water supplies from a wholesale supplier. However, as discussed previously in Chapter 3, the City is currently pursuing the option of participating in the RSWSP, which would use wholesale surface water supply provided by TID. The City's demand for potential wholesale supplies from TID is shown in Table 4-10.

Table 4-10. City of Ceres Demand Projections Provided to TID, AFY (DWR Table 12)

Wholesaler	Potential Contracted Volume	2010 (actual)	2015	2020	2025	2030	2035
TID[(a)]	6,700	0	0	6,700	6,700	6,700	6,700

[(a)] Assumes that the City participates in 6 MGD of RSWSP by 2018.

4.7 COMPLIANCE WITH SBX7-7

4.7.1 Overview

The Water Conservation Act of 2009 (SBx7-7) was one of the four policy bills enacted as part of the November 2009 Comprehensive Water Package. The Water Conservation Act of 2009 provides the regulatory framework to support the statewide reduction in urban per capita water use described in the 20x2020 Water Conservation Plan (DWR and others 2010). It also addresses agricultural water and commercial, industrial, and institutional (CII) water use.

Per SBx7-7, each urban retail water supplier must determine and report its existing baseline water consumption and establish either its own or cooperative targets. This reporting is to begin with the 2010 UWMP, which is required by the Water Conservation Act of 2009.

The City's compliance with SBx7-7 is described in detail in the February 23, 2011 technical memorandum included in Appendix F of this 2010 UWMP. The City developed its baseline and target per capita water uses on an individual basis, and did not participate in any regional alliance. As described in the technical memorandum and summarized below, the City used Target Method 1 to establish an Interim (2015) Per Capita Water Use Target of 219 gpcd, and a Final (2020) Per Capita Water Use Target of 194 gpcd.

The City held a public hearing on March 28, 2011 to discuss and adopt the Target Method and resulting interim and final targets. The following issues were discussed during the public hearing:

- Allow community input regarding the urban retail water supplier's implementation plan for complying with SBx7-7;
- Consider the economic impacts of the urban retail water supplier's implementation plan for complying with SBx7-7; and

- Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.

4.7.2 Determination of Baseline and Target Per Capita Water Use

As described in Appendix F, the City's baseline per capita water uses were determined based on the methodologies described in DWR's October 1, 2010 *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use* (DWR Methodologies).

Consistent with DWR Methodology 1 (Gross Water Use), the City's gross water use is based on the metered quantity of groundwater pumped by the City from its municipal production wells for municipal use and the City's service area population.

Consistent with DWR Methodology 2 (Service Area Population), the City's service area population has been estimated using DOF and the United States Census Bureau to the extent that it is available. As described in Chapter 2, the existing City limit includes a small area in the northwestern part of the City that is served by the City of Modesto. To determine the City's actual water service area population, the DOF population estimates were adjusted based on dwelling unit counts and average person per household densities reported by DOF to exclude the population within the City limit that is served by the City of Modesto. It is estimated that approximately 1,200 people are served by the City of Modesto.

The City's baseline per capita water use was based on the parameters shown in Table 4-11.

Table 4-11. Base Period Ranges (DWR Table 13)

Base	Parameter	Value	Units
10- to 15-year base period	2008 total water deliveries	10,613	AFY
	2008 total volume of delivered recycled water	0	AFY
	2008 recycled water as a percent of total deliveries	0	Percent
	Number of years in base period[(a)]	10	Years
	Year beginning base period range	1999	
	Year ending base period range[(b)]	2008	
5-year base period	Number of years in base period	5	Years
	Year beginning base period range	2003	
	Year ending base period range[(c)]	2007	

Units = AFY
[(a)] If the 2008 recycled water percent is less than 10 percent, then the first base period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater; the first base period is a continuous 10- to 15-year period.
[(b)] The ending year must be between December 31, 2004 and December 31, 2010.
[(c)] The ending year must be between December 31, 2007 and December 31, 2010.

Since the City had no recycled water deliveries in 2008, a 10-year base period was used to calculate the City's baseline per capita water use (for purposes of Water Code Section 10608.20). The calculation of this 10-year baseline per capita water use is summarized in Table 4-12.

Table 4-12. Base Daily Per Capita Water Use: 10- to 15-Year Range (DWR Table 14)

Base Period Year		Distribution System Population	Daily System Gross Water Use, mgd	Annual Daily Per Capita Water Use, gpcd
Sequence Year	Calendar Year			
Year 1	1999	32,601	8.0	245
Year 2	2000	33,395	8.1	241
Year 3	2001	33,885	8.4	249
Year 4	2002	34,570	9.0	260
Year 5	2003	35,277	8.7	247
Year 6	2004	36,231	9.1	250
Year 7	2005	37,479	9.1	242
Year 8	2006	39,502	9.0	229
Year 9	2007	40,470	9.7	239
Year 10	2008	41,282	9.5	230
Base Daily Per Capita Water Use[(a)]				243

[(a)] Average of annual daily per capita water use for the 10-year period from 1999 to 2008.

The calculation of the City's 5-year baseline per capita water use (for purposes of Water Code Section 10608.22) is shown in Table 4-13.

Table 4-13. Base Daily Per Capita Water Use: 5-Year Range (DWR Table 15)

Base Period Year		Distribution System Population	Daily System Gross Water Use, mgd	Annual Daily Per Capita Water Use, gpcd
Sequence Year	Calendar Year			
Year 1	2003	35,277	8.7	247
Year 2	2004	36,231	9.1	250
Year 3	2005	37,479	9.1	242
Year 4	2006	39,502	9.0	229
Year 5	2007	40,470	9.7	239
Base Daily Per Capita Water Use[(a)]				241

[(a)] Average of annual daily per capita water use for the 5-year period from 2003 to 2007.

Using Target Method 1, the City's interim (2015) per capita water use target is 219 gpcd (90 percent of the 10-year baseline per capita water use of 243 gpcd). The City's final (2020) per capita water use target is 194 gpcd (80 percent of the 10-year baseline per capita water use of 243 gpcd).

These interim and final targets comply with the minimum water use reduction requirement of 229 gpcd (based on 95 percent of the 5-year baseline per capita water use of 241 gallons per capita per day (gpcd)).

These interim and final targets have been used to project the City's future water demands (described above) using the City's projected future service area population (see Table 2-3).

4.7.3 Programs to Achieve Water Demand Reduction Goals

As the City manages its water service area, it recognizes that water is a regional resource as well as a local one. Therefore, regional partnerships, in addition to local projects and conservation measures, play a large role in maximizing the use of available local resources. The City is currently participating in the preparation of an Integrated Regional Water Management Plan (IRWMP) with other local entities, including the Cities of Modesto, Hughson and Turlock, as well as others. Participation in the IRWMP planning process allows the City and its partners to develop a regional plan to identify resources and develop projects to provide sustainable water resources to meet regional water needs.

As described in Chapter 5, the City has implemented almost all of the foundational and programmatic Best Management Practices (BMPs) included in the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding (MOU). Implementation of these programs will allow the City to achieve the water reduction goals required by SBx7-7. In particular, the City is anticipating completion of the meter retrofit/installation project by approximately April/May 2011, and will be implementing a new metered rate structure by September 2011 that will help the City to monitor and track actual water use and reduce per capita water use through the City's water service area. The completion of the metering program will also allow the City to perform system water audits and assist the City in identifying and reducing system losses due to pipeline leaks. Other key programs will be those that target the reduction of outdoor water uses such as residential landscape water surveys (BMP 3.2).

4.7.4 Progress Toward Meeting the Urban Water Use Targets

Water Code 10608.40

Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans submitted pursuant to Section 10631.

The City will report its progress in meeting the established 2015 and 2020 per capita water use targets in the 2015 and 2020 UWMP.

CHAPTER 5
Demand Management and Conservation

5.1 BACKGROUND AND GOALS

The City acknowledges the importance of water conservation and management in reducing water demands, and is committed to an ongoing effort to protect its water resources. During the time when California experienced a severe drought in 1976-1977, the Ceres City Council approved a Water Conservation Program (Section 13.04.130 of Title 13 of the City Municipal Code), which combined watering restrictions and prohibition of water waste with public educational outreach. The original Water Conservation Program adopted in 1977 has been modified over the years to further restrict outdoor landscape irrigation, expand the three-month summer enforcement period to year-round enforcement, and to include provisions in the City Municipal Code to allow for the issue of warnings and fines to water users who violate the City's Water Conservation Program.

The City has also recently developed a Demand Management Measure Implementation Plan, building upon the demand management measures (DMMs) and conservation strategies identified and documented in the 2005 UWMP, with the intent to better define the City's specific water conservation programs and to plan for implementation and tracking of the Demand Management Measure Implementation Plan in the future. The City's goals are to conserve water through enforcement, education, public relations, and customer service. The City strives to meet this challenge by working in a friendly, respectful and positive manner with homeowners, businesses and property managers.

This chapter documents the City's system-wide water conservation plans including acceptable water efficiency measures and an implementation plan which will decrease water use and water loss while using the most cost-effective methods. Furthermore, with the preparation and implementation of the Demand Management Measure Implementation Plan, the City aims to:

1. Comply with Assembly Bill 1420 (AB 1420) requiring the implementation of fourteen baseline conservation measures of BMPs;
2. Meet California Urban Water Conservation Council goals as outlined in the Memorandum of Understanding Regarding Urban Water Conservation in California for the fourteen conservation measures identified in the 2005 UWMP; and
3. Create an implementation program for conservation measures based on affordability and feasibility.

A copy of the City's Demand Management Measure Implementation Plan is provided in Appendix G.

The City's Water Conservation Program is administered through the City's Water Services Division of the Public Works Department. The City has implemented almost all of the Best Management Practices included in the 2005 UWMP program as defined in the December 2008 CUWCC MOU (the corresponding document to the DMMs denoted in the UWMP Guidelines and the State's AB 1420 water use efficiency program).

5.2 RELATIONSHIP OF THE CUWCC BMPS TO THE UWMP ACT DMMS

In accordance with Water Code Section 10631 (f) (g),

A plan shall be adopted in accordance with this chapter and shall do all of the following:

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

(J) Wholesale agency programs.

(K) Conservation pricing.

(L) Water conservation coordinator.

(M) Water waste prohibition.

(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

In 2009, the CUWCC restructured the organization of its BMPs to group them according to type. The 14 CUWCC BMPs have now been reorganized into two primary categories: Foundational BMPs and Programmatic BMPs. Although these BMP names and organization have been modified, they still correlate to the 14 DMMs identified in the UWMP Act (Water Code Section 10631(f)). Table 5-1 provides an overview of the reorganization of the CUWCC BMPs.

Furthermore, these same fourteen measures have since become the primary measures by which the DWR Office of Water Use Efficiency measures compliance with AB 1420. AB 1420 amended the Urban Water Management Planning Act, Water Code Section 10610 *et seq.* to require, effective January 1, 2009, that the terms of, and eligibility for, any water management grant or loan made to an urban water supplier and awarded or administered by the DWR, State Water Resources Control Board (SWRCB) or California Bay-Delta Authority (CBDA) or its successor agency, be conditioned on the implementation of the DMMs described in Water Code Section 10631(f). AB 1420 certification requires that each DMM be implemented to the levels of coverage as specified in the CUWCC MOU.

The City has implemented almost all of the CUWCC BMPs. Table 5-2 provides a status of the City's current water conservation policies and programs as they relate to the CUWCC BMPs. Additional descriptions for the City's water conservation policies and programs are provided in the following sections and are organized by BMP program. The City recognizes the importance of BMPs in reducing water demand and will continue to implement these measures as discussed below.

Table 5-1. CUWCC Reorganization of Best Management Practices

Previous List of Best Management Practices (BMP)	Revised List of Best Management Practices Per California Urban Water Conservation Council MOU
BMP 1: Water Survey Programs for Single-Family Residential and Multi-Family Residential Customers	**Foundational BMPs** 1. Utility Operations Programs BMP 1.1.1 Operations--Conservation Coordinator (formerly BMP 12) BMP 1.1.2 Operations--Water Waste Prevention (formerly BMP 13) BMP 1.1.3 Operations--Wholesale Agency Assistance Programs (formerly BMP 10) BMP 1.2 Water Loss Control—System Water Audits, Leak Detection and Repair (formerly BMP 3) BMP 1.3 Metering--Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections (formerly BMP 4) BMP 1.4 Pricing—Retail Conservation Pricing (formerly BMP 11) 2. Education Programs BMP 2.1 Education--Public Information Programs (formerly BMP 7) BMP 2.2 Education--School Education Programs (formerly BMP 8)
BMP 2: Residential Plumbing Retrofit	
BMP 3: System Water Audits, Leak Detection and Repair	
BMP 4: Metering with Commodity Rates for All New Connection and Retrofit of Existing Connections	
BMP 5: Large Landscape Conservation Programs and Incentives	
BMP 6: High-Efficiency Clothes Washing Machine Financial Incentive Programs	
BMP 7: Public Information Programs	
BMP 8: School Education Programs	
BMP 9: Conservation Programs for Commercial, Industrial, and Institutional (CII) Accounts	**Programmatic BMPs** 3. Residential Programs BMP 3.1 Residential Assistance Program (formerly BMPs 1 and 2) BMP 3.2 Landscape Water Survey (formerly BMP 1) BMP 3.3 High-efficiency clothes washers (HECWs) (formerly BMP 6) BMP 3.4 WaterSense Specification (WSS) toilets (formerly BMP 14) BMP 3.5 WaterSense Specifications for residential development [(a)] 4. Commercial, Industrial, and Institutional Programs BMP 4 Conservation Programs for Commercial, Industrial, and Institutional (CII) Accounts (formerly BMP 9) 5. Landscape Programs BMP 5 Large Landscape Conservation Programs and Incentives (formerly BMP 5)
BMP 10: Wholesale Agency Assistance Programs	
BMP 11: Retail Conservation Pricing	
BMP 12: Conservation Coordinator	
BMP 13: Water Waste Prohibition	
BMP 14: Residential ULFT Replacement Programs	

[(a)] BMP 3.5 is a new program added as part of the reorganization of BMPs completed in 2009.

Table 5-2. Summary of City of Ceres' Water Conservation Policies and Programs

BMP Category		BMP Program Description	City Implementation Status
Foundational BMPs	Utility Operations Programs	BMP 1.1.1 Operations-Conservation Coordinator (formerly BMP/DMM 12)	• The City has fully implemented this program and has achieved the CUWCC goal.
		BMP 1.1.2 Operations-Water Waste Prevention (formerly BMP/DMM 13)	• The City has implemented this program through its adoption of a Water Conservation Program that supports local ordinances that prohibit water waste.
		BMP 1.1.3 Operations-Wholesale Agency Assistance Programs (formerly BMP/DMM 10)	• Not applicable, as the City is not a wholesale water agency.
		BMP 1.2 Water Loss Control-System Water Audits, Leak Detection and Repair (formerly BMP/DMM 3)	• The City is currently implementing this program, but has not yet achieved the CUWCC goal (see Chapter 5 for discussion of future program).
		BMP 1.3 Metering-Metering with Commodity Rates for All New Connection and Retrofit of Existing Connections (formerly BMP/DMM 4)	• The City is currently implementing this program and will be fully metered by April 2011 and billed on a commodity basis by September 2011, but has not yet achieved the CUWCC goal (see Chapter 5 for discussion of future program).
		BMP 1.4 Pricing-Retail Conservation Pricing (formerly BMP/DMM 11)	• The City is currently implementing this program, but has not yet achieved the CUWCC goal (see Chapter 5 for discussion of future program).
	Education Programs	BMP 2.1 Education-Public Information Programs (formerly BMP/DMM 7)	• The City is currently implementing this program, but has not yet achieved the CUWCC goal (see Chapter 5 for discussion of future program).
		BMP 2.2 Education-School Education Programs (formerly BMP/DMM 8)	• The City is currently implementing this program, but has not yet achieved the CUWCC goal (see Chapter 5 for discussion of future program).
Programmatic BMPs	Residential Programs	BMP 3.1 Residential Assistance Program (formerly BMP/DMMs 1 and 2)	• Water Survey Programs: The City anticipates implementing a more formalized program for residential water surveys to achieve the CUWCC goal (see Chapter 5 for discussion of future program). • Residential Plumbing Retrofit: The City is currently implementing this program, but has not yet achieved the CUWCC goal (see Chapter 5 for discussion of future program).
		BMP 3.2 Landscape Water Survey (formerly BMP/DMM 1)	• The City has anticipates implementing a more formalized program for residential water surveys to achieve the CUWCC goal (see Chapter 5 for discussion of future program).
		BMP 3.3 High-efficiency clothes washers (HECWs) (formerly BMP/DMM 6)	• The City anticipates implementing rebates in Spring/Summer 2011 to achieve the CUWCC goal (see Chapter 5 for discussion of future program).
		BMP 3.4 WaterSense Specification (WSS) toilets (formerly BMP/DMM 14)	• The City anticipates implementing rebates in Spring/Summer 2011 to achieve the CUWCC goal (see Chapter 5 for discussion of future program).
		BMP 3.5 WaterSense Specifications for residential development	• The City has not yet implemented this program, but plans to implement mandatory provisions for CALGreen to achieve the CUWCC goal (see Chapter 5 for discussion of future program).
	Commercial, Industrial, and Institutional Programs	BMP 4 Conservation Programs for Commercial, Industrial, and Institutional (CII) Accounts (formerly BMP/DMM 9)	• The City has not fully implemented this program, but it anticipates tracking high water use from CII accounts for targeted water use surveys with the use of AMI meter reading technology (see Chapter 5 for discussion of future program).
	Landscape Programs	BMP 5 Large Landscape Conservation Programs and Incentives (formerly BMP/DMM 5)	• The City has not fully implemented this program; non-potable water supply is recommended for large landscaped areas to help achieve the CUWCC goal (see Chapter 5 for discussion of future program).

5.3 CURRENT AND PLANNED IMPLEMENTATION OF THE FOUNDATIONAL BMPS

The Foundational BMPs are considered to be essential water conservation activities by any utility and are summarized in Table 5-3.

Table 5-3. Summary of Foundational BMPs

Foundational BMP Category	Foundational BMP Program	Former BMP/DMM Number
1. Utility Operations Programs	BMP 1.1.1 Conservation Coordinator	formerly BMP/DMM 12
	BMP 1.1.2 Water Waste Prevention	formerly BMP/DMM 13
	BMP 1.1.3 Wholesale Agency Assistance Programs[(a)]	formerly BMP/DMM 10
	BMP 1.2 Water Loss Control	formerly BMP/DMM 3
	BMP 1.3 Metering with Commodity Rates for All New Connection and Retrofit of Existing Connections	formerly BMP/DMM 4
	BMP 1.4 Retail Conservation Pricing	formerly BMP/DMM 11
2. Education Programs	BMP 2.1 Public Information Programs	formerly BMP/DMM 7
	BMP 2.2 School Education Programs	formerly BMP/DMM 8

[(a)] This Foundational BMP Program is not currently implemented, as the City is not a wholesale water agency, as discussed in *Section 5.5*.

The City's current and planned activities related to these Foundational BMPs are described below.

5.3.1 BMP 1.1.1 Conservation Coordinator (formerly BMP/DMM 12: Water Conservation Coordinator)

5.3.1.1 Existing Program

The City has historically employed a seasonal water conservationist nearly every year since 1987. For several years, in the late 1980's and early 1990's, two seasonal conservationists were hired. In 2009, a full-time water conservation coordinator position was authorized by the City Council and this position remains filled today.

The Water Conservation Coordinator's role is to develop, implement and manage the City's Water Conservation Program and to coordinate with on-going conservation programs in other departments and other agencies. Specifically, the Water Conservation Coordinator performs the following tasks:

- Provides conservation information to residents and commercial businesses;
- Coordinates the development of uniform conservation policies and enforcement;
- Develops, recommends and maintains various media sources for providing conservation information;

- Plans, coordinates and administers various day-to-day activities pertaining to the City's Water Conservation Program;
- Promotes the efficient use of the City's water supply by residential, irrigation, industrial, commercial, public agencies, and other customers to ensure sufficient pressure throughout the system for fire protection and other essential City services; and,
- Investigates and identifies compliance issues; and communicates with regulatory agencies as required.

The Water Conservation Coordinator also works closely with Water Services Division staff to contact customers with excessively high use and promote water conservation.

5.3.1.2 Future Program

The City will continue to keep the position of the Water Conservation Coordinator filled and implement this BMP program as described above to comply with BMP 1.1.1. It is also recommended that contact information for the Water Conservation Coordinator be posted on the City's website.

5.3.1.3 Effectiveness Evaluation

The water savings assumptions from implementation of this BMP program are not quantified. However, the effectiveness of this program will be evaluated through water savings from enforcement of legislation and regulations (based on anticipated savings from device(s) applied to the population subject to the regulation(s)).

5.3.2 BMP 1.1.2 Water Waste Prevention (formerly BMP/DMM 13: Water Waste Prohibitions)

5.3.2.1 Existing Program

In 1977, the City established a no waste ordinance as part of its Water Conservation Program (Section 13.04.130 of the City Municipal Code), which is actively enforced. Enforcement includes educating customers, patrolling streets watching for water wasters, and issuing warnings and fines for violations. A copy of the ordinance is included in Appendix H. A brief summary of the no waste ordinance rules and regulations are as follows:

1) No watering on Mondays and no watering any day from 12:00 p.m. to 7:00 p.m.
2) Odd-numbered addresses may water outdoors only on Wednesdays, Fridays, and Sundays.
3) Even-numbered addresses may water outdoors only on Tuesdays, Thursdays, and Saturdays.
4) Vehicles may be washed on the days and during the hours allowed for by address, but only when using a quick-acting positive shut-off nozzle or a bucket and sponge.

5) No water use will be allowed on any day, at any time, for washing off sidewalks, driveways, patios, parking lots, or other exterior non-landscaped areas without the consent of the Public Works Department.

6) No water will be allowed to flow into a gutter or other drainage area for longer than five minutes. Water leaks, breaks, or malfunctions in the user's plumbing distribution system or irrigation system shall be repaired within 24 hours after discovery.

7) No watering outside landscaping while raining.

8) Operating evaporative coolers which are not equipped with a re-circulating pump is prohibited.

9) New landscaping installations must comply with all applicable landscape ordinances.

10) Eating establishments are encouraged to serve water only at the customer's request.

11) Exceptions to the no waste ordinance may be made by the Public Works Department upon a showing of good cause and necessity.

12) The following penalties may be added to the utility service customer's account upon violation of the above regulations:

    a) A penalty in the sum of $20 upon the first violation after having received a non-appealable Warning Notice.

    b) A penalty of $50 upon the second violation after having received a non-appealable Warning Notice within a one-year period.

    c) A penalty of $100 upon the third violation after having received a non-appealable Warning Notice within a one-year period.

    d) A penalty of $200 upon the fourth and any subsequent violations after having received a non-appealable Warning Notice within a one-year period.

The City also responds to phone calls from customers calling to report violations. Subsequent site visits are made by the Water Conservation Coordinator to review the reported water waste including providing notice regarding water waste. All violations are recorded and the number of annual violations has remained relatively constant during the recent years. The City anticipates that violations to the no waste ordinance will decrease as the City converts to volumetric billing.

In 1991, the City adopted a Water Shortage Contingency Plan, which documents the necessary emergency response procedures to implement during an interruption of water supplies. The Water Shortage Contingency Plan consists of a four-stage action plan, and action stages may be triggered at any time of the year based on the phasing criteria developed in the Water Shortage Contingency Plan (see Chapter 10, Table 10-1). The City has also developed a draft resolution to declare a Water Shortage Emergency, which will be passed and adopted by the Ceres City Council if a water shortage emergency condition were to occur.

5.3.2.2 Future Program

The City will continue to enforce its no waste ordinance to comply with BMP 1.1.2.

5.3.2.2.1 Effectiveness Evaluation

The effectiveness of this program will be evaluated based on the number of violations observed, as well as the overall demand reduction associated with invoking drought restrictions.

5.3.3 BMP 1.2 Water Loss Control (formerly BMP/DMM 3: System Water Audits, Leak Detection and Repair)

5.3.3.1 Existing Program

Repair and maintenance of the water distribution system are priorities for the City. In addition to the City's Water Conservation Program, the City also has Capital Improvement Projects that provide for maintenance programs that maximize efficiency of water distribution system operations and minimize water losses. These programs include quick responses to water main leak detection and repair, using the SCADA system to monitor groundwater production, retrofitting or recalibration of well meters, and annual pump efficiency testing.

Daily water production from the City's wells is recorded and used to monitor water use. The City is currently in the process of retrofitting well meters. After all propeller meters have been replaced, the City will schedule for recalibration of well meters on a two year cycle. Pump efficiency tests are completed annually, and approximately one pump is scheduled to be replaced each year.

City maintenance staff regularly checks the water distribution system for leaks during their daily routines. City staff will also investigate and, where appropriate, repair leaks within the City's right-of-way at the customer's request. Additionally, the City maintains records of main breaks which are used to identify mains to be replaced and estimate system water loss.

Special equipment was purchased to aid detection of water leaks, and the City water distribution repair crews respond quickly to complete necessary repairs. Through this effort, unaccounted for water losses have been reduced; however, the distribution system losses cannot be accurately calculated until the water system is completely metered.

The City is in currently the process of installing new meters and associated Automatic Meter Infrastructure (AMI) software and equipment to provide the City with instantaneous and efficient data acquisition capability. As the AMI software and equipment are implemented into system operations for all meters, City staff will be able to better track and control unaccounted for water losses, which will lead to better system leak detection (see BMP 1.3 for more details).

5.3.3.2 Future Program

The City has budgeted for a planned leak detection program and a full water system audit in 2012. The City will initially target an unaccounted for water loss percentage of 10 percent, which is consistent with American Water Works Association (AWWA) published manual of water supply practices (M36). An annual pre-screening system audit will be conducted, in which the City will determine metered sales and other verifiable uses (in acre-feet). These amounts will be summed and divided by the total supply into the water system to determine the quantity of water loss. If the calculated quantity is less than 0.9, a full water system audit will be conducted; if the

calculated quantity is greater than or equal to 0.9, then nothing more will be completed as part of this BMP program.

With the implementation of the new AMI software and equipment for all meters, City maintenance staff will be able to advise customers system-wide whenever it appears possible that leaks exist on the customer's side of the meter (*e.g.*, high water use might indicate a leak). Since Fall 2010, the City has already begun using the AMI software to compile weekly customer excessive use reports. In addition, a systematic program will also be used by City maintenance staff to detect and track the repair of water main leaks to maintain or reduce water system losses.

5.3.3.3 Effectiveness Evaluation

Concurrent with completion of the City's meter retrofit/installation project, the City will track effectiveness of implementation of this BMP program based on reductions in water loss throughout the distribution system.

5.3.4 BMP 1.3 Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections (formerly BMP/DMM 4: Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections)

5.3.4.1 Existing Program

Since 1992, water meters have been installed for all new residential units; however, the metered residential units are billed at a flat rate. Also, most existing single family residential water connections (pre-1992) are traditionally not metered and are also billed at a flat rate. Water use for the majority of the remaining multi-family housing, commercial, industrial, and institutional/governmental facilities is metered, and the corresponding tiered metered rate structure encourages water conservation. The City also conducts weekly reviews using the newly installed AMI software and equipment to identify customers with excessive water use, and subsequently notifies those customers to review high water usage and offer a water audit.

In early 2010, the City developed and began a meter retrofit/installation project to convert all existing flat rate residential customers to metered connections. The City is anticipating completion of the meter retrofit/installation project by approximately April 2011, and will be implementing a new metered rate structure, as summarized in Table 5-4, by early 2012 that will encourage conserving behavior by incorporating a uniform volume charge in addition to the fixed meter charge for residential meters. As shown in Table 5-4, the proposed residential metered rate structure will be the sum of two components, (1) a fixed fee that covers a portion of the City's cost of providing water service, and (2) a variable fee based upon monthly metered water use. The proposed non-residential variable fee will initially flatten the tiers to the same charge for all volumes of water use; however, future rates will eventually include a new, tiered structure to provide a stronger incentive to conserve water.

With this new rate structure, water usage reductions will directly reduce cost to the water user, while excessive water use results in increased costs. The new meters will have AMI software and equipment to provide the City with instantaneous and efficient data acquisition capability. As noted previously, the City has already begun to use the AMI capabilities to identify customers with excessively high use.

Table 5-4. City of Ceres Proposed Water Rates and Charges

Proposed Rates (effective Sept. 1, 2011)[a]	Residential[b]	Non-Residential[c]
Service Fee		
5/8" and 3/4"	$19.67	$19.67
1"	$24.00	$24.00
1 1/2"	$30.23	$30.23
2"	$48.38	$48.38
3"	$90.78	$90.78
4"	$151.33	$151.33
6"	$302.29	$302.29
8"	$484.11	$484.11
Variable Fee		
Tier 1 – 0 to 20,000 gal	$0.69/kgal[d]	$1.40/kgal
Tier 2 – 20,001 to 200,000 gal		$1.40/kgal
Tier 3 – Over 200,000 gal		$1.40/kgal

[a] Proposed water rates and charges were adopted by the Ceres City Council on October 11, 2010 (Resolution 2010-129).
[b] Existing residential accounts are billed based on a flat monthly fee of $28.19.
[c] Existing non-residential accounts are billed based on a flat monthly fee of $19.72 with a tiered volumetric charge (Tier 1 = $1.38/kgal, Tier 2 = $1.47/kgal, and Tier 3 = $1.44/kgal).
[d] Residential accounts have a uniform volumetric charge.

5.3.4.2 Future Program

By developing and implementing the meter retrofit/installation project and metered rate structure, the City now has a more focused and direct monitoring tool allowing it to detect high water usages and to better determine and track unaccounted for water. As data is collected on metered water use, the metered rate structure should be reassessed during the City's financial planning processes. As the City transitions into implementation of this metered rate structure, it will be important that the meter reads (water use) and billing (charges) software programs integrate seamlessly so the City can easily track water use and charges by water use sector.

In the future, City staff will develop a schedule for meter testing, repair and replacement to address aging meters. With the implementation of the new AMI software and equipment for all meters, City staff will be able to identify and track system-wide water use from each individual water use sector. In the future, the City will also be able to track the number of CII mixed use accounts as they are retrofitted with dedicated irrigation meters.

5.3.4.3 Effectiveness Evaluation

Effectiveness of the metering program will be monitored by tracking the annual metered water use. In the City's Draft Water Master Plan, it is assumed that the combined effect from meter retrofits and volumetric rates will result in at least a 10 percent reduction in water demand from previously unmetered residential water users.

5.3.5 BMP 1.4 Retail Conservation Pricing (formerly BMP/DMM 11: Conservation Pricing)

5.3.5.1 Existing Program

The Ceres City Council adopted Resolution 2010-129, which established charges for metered water services as of October 11, 2010. The proposed metered rate structure (to be implemented in early 2012) was designed to promote conservation. Under this proposed metered rate structure, residential metered accounts will pay a uniform volume charge of $0.69/kgal. The City's proposed rate structure is shown in Table 5-4. In addition, administrative fees are assessed upon subsequent violations of the no waste ordinance and/or repair of identified water leaks within 24 hours after receiving a non-appealable Warning Notice as discussed under BMP 1.1.2.

Traditionally, all residential units in the City have been charged a flat rate for water use; however, the City is currently completing their meter retrofit/installation project, in which it is installing meters at all unmetered residential accounts. Once the meter retrofit/installation project is complete, the City will begin charging volumetrically for all types of water use. All accounts will be billed at a fixed rate with a volumetric charge as shown in Table 5-4.

5.3.5.2 Future Program

Conservation pricing requires volumetric rates, so metered service connections are a necessary condition. The City will begin charging all water users based on volumetric pricing once all residential service connections are metered, which will occur in early 2012. As required, the City will evaluate the need to re-adjust rates in order to ensure continued compliance for this BMP program.

5.3.5.3 Effectiveness Evaluation

Once the meter retrofit/installation project is completed and the new metered rate structure is implemented, City staff will evaluate the effectiveness of conservation rates by tracking changes in unit water use resulting from rate increases.

5.3.6 BMP 2.1 Public Information Programs (formerly BMP/DMM 7: Public Information Programs)

5.3.6.1 Existing Program

The City promotes water conservation year-round by distributing information to the public through a variety of methods including personal contact, utility bill inserts, annual water quality reports, brochures, radio public service announcements, information posted on the City's website, and at special events and presentations. In addition, the outdoor water use schedule has been printed in Spanish and English and is publicized in the local newspaper. New customers also receive a magnet summarizing the outdoor water use schedule.

The City has asked restaurants to serve water only upon request. In addition, City staff speaks to community service organizations to promote water conservation activities (*e.g.*, Lions Club and Rotary Club) and has also conducted training sessions on water conservation to members of the Parks Operations Division. City staff also attends County Municipal Advisory Council meetings and provides information.

The City also attends the annual Ceres Street Fair. At this event, the City has a booth that promotes water conservation activities and other environmental causes. City staff hands out flyers regarding water conservation including giveaways such as low-flow garden hose nozzles. Water conservation kits are also available year round at the Public Works Department, and are provided to customers that request them. Water conservation kits include items such as:

- Toilet flapper,
- Toilet tank displacement bag,
- Toilet tank leak detection tablets,
- Low-flow restrictor,
- Low-flow shower head,
- Faucet aerator,
- Moisture meter,
- Drip gauge, and
- Flyer with information regarding water conservation.

These kits are also provided to customers during on-site visits performed by the Water Conservation Coordinator.

The City will continue these existing efforts to provide public outreach regarding water conservation in the future. Budget for public outreach programs is currently included in the City's Water Conservation Program costs.

5.3.6.2 Future Program

The City will continue to implement public outreach strategies as described above. At a minimum, City staff will (1) provide contact with the public and media at least quarterly during the year, (2) maintain an active website, which is updated quarterly, to promote and educate visitors on water conservation, and (3) continue to budget for public outreach regarding water conservation.

5.3.6.3 Effectiveness Evaluation

This BMP program is an essential component of developing water conservation awareness; however, it is qualitative and cannot be defined in quantitative terms.

5.3.7 BMP 2.2 School Education Programs (formerly BMP/DMM 8: School Education Programs)

5.3.7.1 Existing Program

The City works with the Ceres Unified School District to promote conservation of water and other resources, and prevent water wasting at school facilities. The City provides occasional water conservation presentations to lower and upper grade classrooms, where students are given conservation materials to take home and share with family members.

In addition to school outreach, the City participates with the Stanislaus County Office of Education's Stanislaus/Tuolumne Environmental Education Project (STEEP) Region VI B of the California Regional Environmental Education Consortium (CREEC) network. A representative of the City attends the Committee meetings to plan future teacher workshops and activities. STEEP has put on workshops including the Project Water Education for Teachers (WET) training. The City's representative has participated in providing training on water conservation, pollution prevention, and recycling.

The City will continue these existing efforts to provide school education programs regarding water conservation in the future. Budget for school education programs is currently included in the City's Water Conservation Program costs.

5.3.7.2 Future Program

The City will continue to implement this BMP program as described above and investigate ways to expand water conservation education in local schools. As a minimum, City staff will develop and distribute curriculum materials that meet State education framework requirements and are grade-level appropriate and continue to budget for a school education program regarding water conservation.

5.3.7.3 Effectiveness Evaluation

This BMP program is an essential component of developing water conservation awareness; however, it is qualitative and cannot be defined in quantitative terms.

5.4 CURRENT AND PLANNED IMPLEMENTATION OF THE PROGRAMMATIC BMPS

The Programmatic BMPs are summarized in Table 5-5.

Table 5-5. Summary of Programmatic BMPs

Programmatic BMP Category	Programmatic BMP Program	Former BMP/DMM Number
1. Residential Programs	BMP 3.1 Residential Assistance Program	formerly BMP/DMMs 1 and 2
	BMP 3.2 Landscape Water Survey	formerly BMP/DMM 1
	BMP 3.3 High-efficiency clothes washers (HECWs)	formerly BMP/DMM 6
	BMP 3.4 WaterSense Specification (WSS) toilets	formerly BMP/DMM 14
	BMP 3.5 WaterSense Specifications for residential development	
2. Commercial, Industrial, and Institutional Programs	BMP 4 Commercial, Industrial, and Institutional (CII)	formerly BMP/DMM 9
3. Landscape Programs	BMP Landscape	formerly BMP/DMM 5

The City's current and planned activities related to these Programmatic BMPs are described below.

5.4.1 BMP 3.1 Residential Assistance Program (formerly BMP/DMM 1: Water Survey Programs for Single Family and Multi-Family Residential Customers and BMP/DMM 2: Residential Plumbing Retrofit)

5.4.1.1 Water Survey Programs

5.4.1.1.1 Existing Program

Water surveys for residential users help raise awareness of water conservation inside and outside of the home and help conserve water during everyday use. The Water Conservation Coordinator and Water Services Division staff members are available upon request to program landscape irrigation controllers, adjust sprinkler heads, and provide minor advice on sprinkler systems. In the past, the City has offered these free services upon request, but has not had a formal survey program. At the present time, the City does not have the personnel to perform complete interior and exterior residential water use surveys. However, when distributing water conservation kits, City staff will record the customer's address, age of home, and number of bathrooms in anticipation of developing a formal water survey program.

The exterior audit program was initiated in 1994 and included a general landscape survey. The interior water survey program was scheduled to start in 2010, but has been delayed until the City has sufficient staff to perform this task, and will generally include measuring the flow rates of existing fixtures, tests for toilet leakage, installing low-flow fixtures, *etc.* Audit reports would likely include the number of people in the household, number of bathrooms, age of appliances, and lot and landscaped footage.

For residential users with high water use, the City contacts them directly via flyers with a notification and offer for a self-survey. When requested, self-surveys are issued, containing survey forms and instructions, which include indoor and outdoor survey components and water conservation information, to improve water use efficiency. City staff tracks and retains all completed self-survey forms. Once the City completes the meter retrofit/installation program with AMI meters, the City will be able to better identify the high water users in its service area including customer-side leaks, and focus on those areas.

5.4.1.1.2 Future Program

The City will look to develop a more formalized program for residential water surveys and landscape water surveys. As is currently being done, the City will continue to target the high water users using the newly installed AMI software and equipment and focus on those areas first; the Water Conservation Coordinator or Water Services Division staff will visit these residential users to provide leak detection assistance by performing surveys that include both indoor and outdoor investigations and to offer suggestions for both single-family and multi-family residences to improve water use efficiency. Surveys will be offered via mailers, bill inserts and/or the City's website.

5.4.1.2 Residential Plumbing Retrofit

5.4.1.2.1 Existing Program

The City requires water efficient equipment to be installed in all new construction and encourages retrofitting plumbing in existing structures with water conserving fixtures, such as ultra-low flush toilets. In addition, the City has distributed free water conservation kits that include EPA WaterSense® certified low-flow showerheads, kitchen and bathroom faucet aerators, toilet tank displacement bags, toilet tank leak detection tablets, *etc.* The City has advertised the availability of these kits to residential users with high water use. Item(s) from these kits are also handed out during the beginning of Water Awareness Month at the annual Ceres Street Fair and over the counter at the Public Works Department.

5.4.1.2.2 Future Program

The City will track the number of kits distributed to the public and monitor the number of new residential, commercial, institutional and industrial establishments constructed with high efficiency equipment as well as the number of establishments remodeled with efficient equipment. The City could also conduct follow-up surveys to determine customer satisfaction with the water conservation kits and retention.

5.4.1.3 Effectiveness Evaluation

The effectiveness of the water survey programs will be measured by monitoring the number of completed self-survey requests. With conversion to complete metered usage, the City will monitor changes in water use and track water demands to target high use accounts. As the City develops a formal survey program, City staff will also be able to track and monitor the number of completed survey requests.

The effectiveness of the plumbing retrofit program will be measured by monitoring the number of new residential, commercial, institutional and industrial establishments constructed with high efficiency equipment as well as the number of establishments remodeled with water efficient equipment. In addition, the number of water conservation kits distributed will also be tracked.

5.4.2 BMP 3.2 Landscape Water Survey (formerly BMP/DMM 1)

It is assumed that residential landscape surveys will be conducted at the same time as indoor residential surveys. Details regarding residential surveys were provided above in BMP 3.1 under the sub-section titled Water Survey Programs.

5.4.3 BMP 3.3 High-Efficiency Clothes Washers (HECWs) (formerly BMP/DMM 6: High-Efficiency Washing Machine Rebate Programs)

5.4.3.1 Existing Program

Pacific Gas & Electric (PG&E) provides natural gas service to City residents. PG&E provides rebates for energy-efficient appliances to its customers, and the City has posted the information and link to receive these rebates on the City's website. Currently, PG&E offers a $50 rebate for energy-efficient clothes washers. Because PG&E customers are also City of Ceres water

customers, in the past, the City has referred water users to PG&E rebates available for clothes washers, but did not provide their own rebates.

5.4.3.2 Future Program

Beginning in Spring/Summer 2011, the City will provide $50 rebates to water users towards the purchase of HECWs meeting the average WaterSense Specification (WSS) water factor value of 5.0 or better. As part of the implementation of this program, the City will develop and maintain a list of qualifying HECWs for residents to use.

As the City converts to metered water use, a database should be set-up to track the installation of high-efficiency washing machines to give the City the ability to track the measurable decrease in metered water usage after installation. The City has budgeted for up to 200 HECW rebates per year.

5.4.3.3 Effectiveness Evaluation

The effectiveness of the high-efficiency washer program will be evaluated by tracking the number of requested and reimbursed rebates.

5.4.4 BMP 3.4 WaterSense Specification (WSS) Toilets (formerly BMP/DMM 14: Residential Ultra-Low Flush Toilet Replacement Programs)

5.4.4.1 Existing Program

The State of California passed legislation requiring all toilets sold and installed after January 1, 1994 to be ultra-low flush toilets (ULFTs) using no more than 1.6 gallons per flush. There have been approximately 6,000 homes built in the City water service area since January 1994 equipped with ultra-low flush toilets. In addition to the new home construction, an unknown number of pre-1994 toilets have been replaced with ultra-low flush toilets. Due to budget constraints, the City has not implemented a formal rebate program to provide financial incentive for customers to meet the WaterSense Specifications.

5.4.4.2 Future Program

Beginning in Spring/Summer 2011, the City will provide $50 rebates to water users towards the purchase of an ULFT. The City has budgeted for up to 200 ULFT rebates per year.

5.4.4.3 Effectiveness Evaluation

The effectiveness of this program will be evaluated by tracking the number of requested and reimbursed rebates and by recording the number of ULFTs incorporated into new construction and remodels in future years.

5.4.5 BMP 3.5 WaterSense Specification for Residential Development

5.4.5.1 Current/Planned Program

Mandatory provisions of the California Green Building Standards (CALGreen) include requirements for the installation of water-efficient plumbing fixtures and weather- or soil moisture-based irrigation controllers in new residential construction.

5.4.5.2 Effectiveness Evaluation

The effectiveness of this program will be measured by recording the number of new buildings and landscapes using water-efficient fixtures and appliances in future years.

5.4.6 BMP 4 Commercial, Industrial, and Institutional (CII) (formerly BMP/DMM 9: Conservation Programs for Commercial, Industrial and Institutional Accounts)

5.4.6.1 Existing Program

CII water connections are metered and billed based on volumetric charges; therefore, CII customers can track their water use through monthly utility bills. Also with the City's conversion to AMI meter reading technology, the benefits of user consumption awareness could lead to increased conservation and alert users of possible leaks within their system.

The City has also adopted the *Water Efficient Landscape Guidelines and Standards*, which pertains to commercial and industrial developments that are new or where significant remodeling or expansion plans are proposed. Commercial and industrial establishments must abide by the City's outdoor water use schedule for landscape watering and are subject to warnings and fines for wasting water.

The City coordinates review of commercial and industrial building applications between the Building Department, Public Works Department, Planning Department, Economic Development Division, and Public Safety Department. Developers are required to install water efficient landscapes and ultra-low flush toilets and urinals on new commercial and industrial developments. The City will only issue construction permits after a thorough review of each building plan for new commercial or industrial developments is completed and the water conservation requirements are deemed met. Historically, the City has not provided water to what are considered "wet industries".

The City encourages developers, who propose large landscaped areas, to install separate meters for landscape irrigation. This helps the commercial or industrial customer monitor outdoor water usage, which can be a major tool to conserve water and can provide an additional incentive to save on sewer fees because sewer charges are based on the amount of metered water used by the customer.

In the early 1990's, the City purchased portable water meters, which the City issues on a temporary basis to contractors that need water for construction. The contractors pay according to the amount of water used, and this has reduced water wasting at construction sites.

5.4.6.2 Future Program

The City will continue to implement this BMP program to reduce water use from the CII sector. With the City's conversion to AMI meter reading technology, CII accounts with high water use will be tracked and targeted for conducting water use surveys.

5.4.6.3 Effectiveness Evaluation

The effectiveness of this BMP program will be measured by monitoring the water use of CII accounts and tracking their water demands. Water use from CII accounts with completed surveys will be compared with historical water use to determine water conservation savings.

5.4.7 BMP 5 Landscape (formerly BMP/DMM 5: Large Landscape Conservation Programs and Incentives)

5.4.7.1 Existing Program

Due to the drought and passage of AB 325 in 1993, the Ceres City Council adopted *Water Efficient Landscape Guidelines and Standards*, which were subsequently revised in 1994. The City worked with landscape designers and contractors, the Building Industry Association, and local developers in developing and revising the guidelines. The guidelines apply to all new single family, multi-family, commercial, and industrial developments. The program is designed to reduce water consumption through the use of trees, shrubs, vines, ground cover, and grasses that are suitable for growing in the Central Valley. The City has compiled a suggested plant list, and efficient irrigation systems are also required for new construction to reduce water consumption.

Landscape and irrigation plans are required to be submitted to the City for review prior to construction. This also applies to existing development if extensive remodeling is to occur where the value of the project exceeds 50 percent of the assessed valuation.

The City has conducted on-site evaluations and worked with existing condominium and apartment owners/managers with large landscaped areas to reduce over-watering. Generally, recommendations have included shorter irrigation times, reducing slopes of turf areas, or replacing high water use areas with drought resistant plants. Recommendations have also included replacing sprinkler heads with more efficient devices and re-setting existing devices to reduce overspray onto hardscapes.

The City has installed water efficient landscapes in new traffic medians, and some of the older medians have been re-landscaped with more appropriate plants. The benefits of this include heightened public awareness of attractive, low water-use landscapes, and the City is actively demonstrating its commitment to improved efficiencies in public water use. In addition to saving water, City maintenance crews have experienced fewer street and gutter repairs as a result of less runoff.

All City parks are closely monitored for water waste and leak detection. Irrigation cycles are adjusted to ensure that no area is watered more than three days per week. The City has over 198 acres of parks, of which approximately 110 acres are developed. The City strives to match water quality with use. For example, the shallower aquifers in the area are generally not tapped for potable water uses due to the presence of contaminants that require treatment. The City has been

converting older, shallower wells or developing new shallow wells to be used exclusively for park landscape irrigation instead of using the treated groundwater sources for these irrigation demands. This strategy serves as both a cost savings to the Landscape Maintenance Division and as a means by which available potable water supply sources can be conserved for potable water uses. Irrigation conservation measures are still utilized at the parks, regardless of water source; but using the shallower water-bearing aquifer zones puts a supply to use that would otherwise go unused in highly urban areas. Currently, all of the City's parks are irrigated using groundwater from shallow wells, except for Smyrna and Roeding Heights Parks. The City has plans to remove the irrigation of these parks from the City's potable water system.

5.4.7.2 Future Program

The City will continue to implement this BMP program to reduce water use from landscape irrigation. The City will also consider revisions to its current landscaping standards to meet or exceed State mandated landscaping guidelines for future development.

For CII accounts with mixed use meters serving a landscaped area greater than two acres, the City will encourage the installation of a dedicated landscape irrigation meter. If a large landscaped area is irrigated with potable water, the City will encourage the customer to evaluate the potential use of shallow groundwater, if potable water supply is currently being used to irrigate this area.

5.4.7.3 Effectiveness Evaluation

Water conservation is achieved by increasing irrigation efficiency at large landscape accounts or by switching to a non-potable irrigation supply source. The effectiveness of this program will be evaluated by calculating the reduction in demand on the potable water system as these areas are switched to a non-potable water supply source. In addition, the City will track the number of large landscapes equipped with efficient irrigation systems and track the number of surveys completed for large landscape customers.

5.5 BMPS NOT BEING IMPLEMENTED OR SCHEDULED FOR IMPLEMENTATION

As described above, the City has implemented almost all of the CUWCC BMPs. However, BMP 1.1.3 (Wholesale Agency Assistance Programs, formerly BMP/DMM 10) will not be implemented and is not scheduled for implementation since the City is not a wholesale provider.

Water Code §10631 (c)

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(1) An average water year.

(2) A single dry water year.

(3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

6.1 RELIABILITY AND VULNERABILITY

As described in Chapter 3, the City currently relies solely on groundwater supply to meet all water demands. The City's water supply is most vulnerable to climatic variability and water quality. Tuolumne River infiltration and the incidental recharge of applied irrigation water are the primary sources of groundwater basin recharge. Drought conditions can reduce available groundwater supplies by reducing available recharge. Therefore, during a multi-year drought, groundwater basin storage would tend to decline (due to reduced annual recharge), possibly resulting in a reduction in pumping in multiple dry years.

The City's future water supply planning incorporates potential surface water supplies from the RSWSP to help protect the groundwater basin from overdraft and water quality degradation. Surface water is expected to be even more vulnerable to climatic variations than groundwater. The water supply, demand, and shortfall estimates presented herein assume that the City will use groundwater as a primary supply source for meeting current demands, and use supplemental surface water from the RSWSP along with groundwater supply to meet future projected demands.

The reliability of groundwater supply is dependent on hydrologic variations and the ability to extract water of acceptable quality from groundwater storage. The City's groundwater supply is also threatened by water quality. In the past, contamination from arsenic, uranium, manganese, nitrate, and specific conductance has resulted in the need for additional treatment to keep wells from being taken off-line. The City has anticipated that increased pumping beyond the current assumed operation yield of 10,000 AFY will have significant impacts on water quality reliability. A further discussion of water quality impacts on reliability can be found in Chapter 7.

Legal issues, including place of use and water rights issues, are not projected to limit supply reliability for the City. The City also does not anticipate that environmental factors will threaten its ability to pump and deliver groundwater supplies as needed to meet current and future demands.

Table 6-1 summarizes the factors contributing to vulnerability of the City's groundwater and future surface water supplies.

Table 6-1. Factors Resulting in Inconsistency of Supply (DWR Table 29)

Name of Supply	Legal	Environmental	Water Quality	Climatic
Local Groundwater[(a)]			X	X
Potential Future RSWSP Surface Water		X		X

[(a)] Local groundwater is vulnerable to climate and water quality events. However, the City of Ceres plans to maintain current groundwater supply availability through well monitoring for early detection, well rehabilitation, wellhead treatment, and blending.

6.2 PROJECTED WATER SUPPLIES

Severe drought conditions occurred in 1976 and 1977, and some of the City's shallow wells were seriously compromised by the lowering groundwater levels. Infrastructure improvements and water conservation allowed the City to continue to supply 100 percent of the City's water demand during the drought period of 1987 to 1992. In 1993, California received above normal precipitation, ending the 1987 - 1992 drought. However, the years after 2000 have been regarded as below normal or dry water years.

For planning purposes, estimated reductions in water supply were based on comparison between existing normal year versus drought year conditions. Water supplied to the City during a normal water year (2000) is compared to the projected water supply associated with a hypothetical decreased percentage of supply for the reliability scenarios of a single dry year (1977) and multiple dry years (1989-1992). The basis of average (normal), single dry, and multiple dry water years in the City are 2000, 1977, and 1989 through 1992 respectively (See Table 6-2).

Table 6-2. Basis for Water Year Data (DWR Table 27)

Water Year Type	Base Year(s)	Assumed Water Supply Availability Groundwater Pumping
Average/Normal Water Year	2000	Assumed to be equal to total demand
Single Dry Water Year	1977	Assumed to be equal to total demand
Multiple Dry Water Years	1989-1992	Assumed to be equal to total demand

Water supply reliability is examined by comparing water supply in a normal year to the supply that would be available during a drought period. Table 6-3 shows the historical supply reliability of the City's supplies in the base years shown in Table 6-2.

Although the Turlock Irrigation District has indicated that the surface water supply available to the City is firm, which is understood to be reliable during multiple dry years, it is assumed that this water supply would be reduced 10% during a single dry year, and 5%, 10%, 15%, and 15% for the four years of a multiple dry year period.

The percentages of water supply reduction presented in Table 6-3 are conservative estimates because the groundwater capacity of the City's well field has not been compromised since infrastructure improvements were instituted during the last drought. The reduction percentages

range between 5 – 15 percent of normal year water supply and are aligned with the reductions of surface water runoff in the basin and supply reduction estimates of other local communities that primarily rely on surface water. Although these percent reductions may not be fully applicable to existing groundwater well conditions, the use of surface water to augment the City's water supplies requires consideration of climatic shortages of all projected supplies.

Table 6-3. Historical Supply Reliability, AFY (DWR Table 28)

Supply	Average / Normal Water Year	Single Dry Water Year	Multiple Dry Water Years			
			Year 1	Year 2	Year 3	Year 4
	2000	1977	1989	1990	1991	1992
Groundwater[(a)]	9,000	8,100	8,600	8,100	7,700	7,700
Percent of Average/Normal Year[(b)]		90%	95%	90%	85%	85%

(a) Hypothetical supply available to the City of Ceres if the single and multiple dry years were to occur.
(b) Based on the assumption that the water supply would be reduced 10% during a single dry year, and 5%, 10%, 15%, and 15% for the four years of a multiple dry year period.

Based on the criteria described above, Table 6-4 shows the City's supply reliability for the next three years based on its current available supplies.

Table 6-4. Current Supply Reliability, AFY (DWR Table 31)

Source	Average/ Normal Water Year Supply (2011)	Multiple Dry Water Year Supply		
		Year 1 (2011)	Year 2 (2012)	Year 3 (2013)
Local Groundwater[(a)]	10,000	9,500	9,000	8,500
Percent of Normal Year		95%	90%	85%

(a) Based on the estimated "operational yield" of the groundwater basin underlying the City's service area.

6.3 WATER MANAGEMENT TOOLS AND OPTIONS TO MAXIMIZE RESOURCES AND MINIMIZE THE NEED TO IMPORT WATER FROM OTHER REGIONS

10620(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

The City is currently pursuing participation in the Regional Surface Water Supply Project, which would provide local Tuolumne River water from TID. Use of this surface water supply gives the City the flexibility to preserve its groundwater supplies.

To minimize the City's vulnerability to groundwater quality issues, the City has also developed strategies to maintain and enhance its groundwater extraction capacity through a combination of well monitoring for early detection, well rehabilitation, wellhead treatment and blending.

With these available management tools, the City does not currently foresee a need to import water from other regions.

6.3 POTENTIAL FUTURE WATER SUPPLY PROJECTS

As described in Chapter 3, the City of Ceres is evaluating potential participation in the RSWSP, which would provide treated surface water using water supplied by Turlock Irrigation District to areas south of the Tuolumne River.

Some project planning, environmental review and design have previously been completed for the RSWSP. The project is currently under review by a steering committee made up of elected city council representatives of the four cities potentially participating in the project (Modesto, Ceres, Hughson and Turlock). The steering committee is anticipated to make a recommendation on whether and how to proceed with the project sometime in 2011. The potential project is summarized in Table 6-5.

Table 6-5. Potential Future Water Supply Projects (DWR Table 26)[(a)]

Project Name	Projected Start Date	Projected Completion Date	Potential Project Constraints	Normal Year Supply	Single Dry Year Supply	Multiple Dry Year Supply (Year 1)	Multiple Dry Year Supply (Year 2)	Multiple Dry Year Supply (Year 3)
RSWSP	2016	2018		6,700	6,000	6,400	6,000	5,700

(a) Based on the assumption that the water supply would be reduced 10% during a single dry year, and 5%, 10%, and 15% for the three years of a multiple dry year period.

6.4 CLIMATE CHANGE

It should be noted that currently there are no specific requirements related to addressing the potential impacts of future climate change on water supplies or water supply reliability included in either the UWMP Act or the Water Conservation Bill of 2009. However, within the next 20 years, DWR expects that water supplies, water demand, sea level rise, and the occurrence and severity of natural disasters will be affected by climate change as follows:

- Water Demand: Hotter days and nights, as well as a longer irrigation season, will increase landscaping and irrigation water needs, and industrial processes will have increased cooling water needs. Peak water demands may also be impacted.
- Water Supply and Quality: Reduced snowpack, shifting spring runoff to earlier in the year, increased potential for algal bloom, and increased potential for seawater intrusion—each has the potential to impact water supply, supply reliability and water quality.
- Sea Level Rise: It is expected that sea level will continue to rise, resulting in near shore ocean changes such as stronger storm surges, more forceful wave energy, and more extreme tides. This will also affect levee stability in low-lying areas and increase flooding.
- Natural Disaster: Natural disasters are expected to become more frequent as climate change brings increased climate variability, resulting in more extreme droughts and floods. This will challenge water supplier operations in several ways as wildfires are expected to become larger and hotter, droughts will become deeper and longer, and floods can become larger and more frequent.

California is addressing the causes and impacts of climate change in a number of different forums. The Global Warming Solutions Act of 2006 (AB 32) clearly identified climate change as a "serious threat to the economic well-being, public health, natural resources, and the environment of California". The California Air Resources Board completed the Climate Change Scoping Plan (2008) to support implementation of AB 32 and the California Natural Resources Agency issued the Climate Change Adaptation Strategy (2009) to identify how California will adapt to expected climate changes.

Responding to climate change generally takes two forms: mitigation and adaptation. Mitigation is taking steps to reduce the contribution to the causes of climate change by reducing greenhouse gas (GHG) emissions. Adaptation is the process of responding to the effects of climate change by modifying systems and behaviors to function in a warmer climate.

In the water sector, climate change mitigation is generally achieved by reducing energy use, becoming more efficient with energy use, and/or substituting fossil fuel-based energy sources for renewable energy sources. Because water requires energy to move, treat, use, and discharge, water conservation results in energy conservation. As each water supplier implements DMM/BMPs and determines its water conservation targets, it can calculate the conserved energy and the GHGs not-emitted as a side benefit. Additionally, water suppliers may want to reconsider DMM/BMPs that conserve water if they do so at a significant increase in GHG emissions. Also,

water suppliers can adapt to climate change through the diversification of its water supply portfolio, increased conjunctive use and introduction or expansion of recycled water use.

For the City, the implementation of its Demand Management Measure Implementation Plan (described in Chapter 5), will help to reduce water demands, and also conserve energy as a result of decreased treatment (chlorination) and pumping requirements. The City's recent installation of residential meters (so that all residential connections are now fully metered), and compliance with SBx7-7 and its interim and final per capita water use targets will ensure continued water conservation and energy conservation in the future. Also, the City's future use of surface water supply from TID will help to diversify the City's water supplies and enhance the City's water supply reliability to "adapt" to the changing hydrologic conditions associated with climate change.

Water Code §10634

The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

7.1 WATER QUALITY IMPACTS

Variable water quality can restrict the quantity of supplies available to meet urban demands. The City's water supply currently consists solely of local groundwater. There are concerns that the quality of the groundwater in several of the City's well could potentially limit their use as municipal supply wells and/or require additional reliance on wellhead treatment.

The City has experienced some issues related to groundwater quality. As discussed in Chapter 3, nearly all of the City's active wells are impacted by a combination of inorganic contaminants with the exception of Well 28 which is currently used as a blending source for Well 25, and the City's newest wells (Wells 34, 35, 36 and 38). Concentration levels of arsenic, uranium, nitrate, manganese, and specific conductance in excess of drinking water regulatory maximum contaminant levels (MCLs) have resulted in some of the City's production wells being taken out of service, and the initiation of different blending and wellhead treatment programs. Well outages have reduced the City's overall hydraulic pumping capacity. The City's firm groundwater pumping capacity is about 12,700 gpm, and approximately 5,400 gpm of this total capacity is groundwater that is currently treated or blended. Currently, treated/blended groundwater accounts for 43 percent of the City's current firm groundwater pumping capacity. If groundwater pumpage is increased to meet future needs, groundwater levels in the City are expected to decline and possibly impact existing groundwater gradients and flow directions. This will likely affect the direction and gradient of existing groundwater contaminant plumes, and possibly create well drawdown cones of depression, causing increased water quality concerns.

If the City successfully participates in the RSWSP (anticipated by 2018), surface water supply from the project will supplement the City's use of groundwater to meet demand. This will help maintain and protect the City's groundwater resource. If the RSWSP does not go forward, the City will need to seek additional supplemental surface supply.

The City conducts routine water quality sampling and well monitoring for early identification of water quality problems. The City's capital improvement program also includes several on-going projects that directly or indirectly address on-going water quality issues. These projects include installation of new wells to increase supply capacity, replacement of wells, as they are retired from service due to age or water quality issues, and installation of wellhead treatment, as needed to maintain water system capacity.

Installing new wells will help alleviate low flow problems and/or maintain adequate system pressures for existing customers during high demand conditions; and provide additional capacity to meet increasing demands for new growth. It is estimated that a total of six new wells will be needed through the 2035 timeframe. The new wells will help eliminate existing system deficiencies and increase future groundwater supply reliability.

Many of the City's wells are at or near their estimated service life and may need to be replaced in the coming years to maintain the City's existing groundwater production capacity. It is estimated that a total of eleven replacement wells producing an average of 900 gpm each will be needed through the 2035 timeframe.

The City's CIP also provides funding for the design and construction of wellhead treatment or blending facilities for replacement wells and new wells throughout the water service area that may be exposed to high contaminant levels and may be at risk of exceeding mandated MCLs. Some of the new and replacement wells are expected to require either oxidation/filtration treatment or ion exchange treatment.

Through its well monitoring and capital improvement programs, the City expects to maintain well capacity to meet current and future demands. As noted previously, the City is evaluating participation in the RSWSP, which will provide the City more flexibility in maintaining well capacity in excess of that needed to meet future annual and peak demands.

Should the City not participate in the RSWSP, the City will continue to seek alternate treated surface water supply sources to supplement its groundwater supply. Wells are also anticipated to require increased blending and treatment in the future. Therefore, water quality is not expected to contribute to long-term changes in available water supplies. Table 7-1 summarizes potential water supply quantity changes due to water quality issues.

Table 7-1. Current and Projected Water Supply Changes due to Water Quality (DWR Table 30)

Water Source	2010	2015	2020	2025	2030	2035
Local Groundwater	0	0	0	0	0	0

7.2 IMPLICATIONS FOR WATER MANAGEMENT

The City has developed a strategy incorporating monitoring for early identification, well replacement, wellhead treatment, and blending to allow pumping and delivery of groundwater as necessary to meet current and future demands. The City is also seeking to diversify its supply sources by participation in the RSWSP project. Because the annual groundwater yield is not projected to be reduced due to water quality considerations, there are no implications for water management associated with reductions in available groundwater supplies.

Water Code § 10633

The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

8.1 COORDINATION

Over the years, the City has evaluated the potential of developing recycled water use to help offset existing potable use, and to assist with wastewater disposal. The City is a member of the Turlock Groundwater Basin Association's Groundwater Coordination Committee which meets monthly, where water recycling and groundwater recharge has been discussed. Also, as part of the IRWMP (of which the City is a participant), the potential regionalization of wastewater treatment possible production of tertiary recycled water is being discussed.

8.2 WASTEWATER QUANTITY, QUALITY AND CURRENT ISSUES

Water Code § 10633 (a)

The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

The City currently manages wastewater collection and treatment for all except the northwest portion of the City. The City's wastewater treatment plant (WWTP) has been in its current location since before 1970. On average, the City's WWTP handles an inflow of 3.1 MGD. In the northwest portion of the City, the City manages the collection system, but exports wastewater to the Modesto trunk sewer system. The City also exports a significant portion of the wastewater treated at the City's WWTP to the Turlock Regional Water Quality Control Facility (RWQCF). The City's WWTP does not discharge any treated wastewater from its wastewater treatment plant to a river or any other surface water body. Instead, treated wastewater is either discharged into on-site ponds for evaporation and incidental groundwater recharge, or exported to Turlock.

The following summarizes the City's current methods of wastewater disposal:

- Approximately 1.3 MGD of wastewater flow from the northwestern portion of the City and an unincorporated county area adjacent to City limits is sent to the Modesto trunk sewer system for treatment and disposal at the City of Modesto's wastewater treatment facilities (land application, recycled water use, or discharge to the San Joaquin River);
- Wastewater flows from the remainder of the City are sent to the City's WWTP for treatment. Up to 2.5 MGD can be disposed of through on-site percolation ponds for evaporation and incidental groundwater recharge. Up to 1.0 MGD of treated effluent can be sent to the City of Turlock for treatment and disposal at the Turlock RWQCF. The City is in the process of increasing its export capacity to 2.0 MGD.

Current and projected City wastewater flows are presented in Table 8-1.

Table 8-1. Wastewater Collection and Treatment, AFY (DWR Table 21)

Wastewater Collection and Treatment	2010	2015	2020	2025	2030	2035
Wastewater collection and treatment	4,800	5,800	6,700	7,700	8,600	9,600
Volume that meets recycled water standards	0	0	0	0	0	0

8.3 WASTEWATER DISPOSAL AND POTENTIAL RECYCLED WATER USES

Water Code § 10633 (b)(c)(d)

The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

8.3.1 Wastewater Disposal

Wastewater treatment and disposal at the City's existing WWTP is regulated under Waste Discharge Requirements Order No. 93-237 (WDRs). These WDRs were prepared pursuant to the requirements of the Porter-Cologne Water Quality Control Act (Porter-Cologne) and the Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board, Central Valley Region, which includes Resolution No. 68-16, the State's anti-degradation policy. Because the City's WWTP discharges to land, it is not subject to the National Pollution Discharge Elimination System (NPDES) requirements for discharges to surface water.

Currently, about 1.3 MGD of wastewater flow from the North Ceres area of the collection system is exported to the City of Modesto's trunk sewer system for treatment and disposal at the City of Modesto's wastewater facilities. Approximately 1.0 MGD of treated wastewater is sent south to the City of Turlock for treatment at the Turlock RWQCF. The City also has the potential to expand its export capacity to the City of Turlock to 5.9 MGD in the future, and is currently in the process of purchasing an additional 1.0 MGD of export capacity. The City is currently permitted to dispose of up to 2,800 AFY of wastewater at its on-site percolation ponds. The quality of this percolated water is monitored. As discussed previously, the City's treated wastewater is not discharged to a river or any other body of water at this site.

The City's current and projected wastewater disposal methods are presented in Table 8-2. The City's future projected wastewater quantities exceed currently available disposal capacity. As part of its Wastewater Collection System Master Plan, the City is assessing future disposal options for wastewater. The master plan evaluated three alternatives for wastewater disposal: increased export to the City of Turlock, increased export to the City of Modesto, and tertiary treatment and re-use. Tertiary treatment and reuse was found to be significantly more expensive than other alternatives, and is not currently under consideration due to its significantly higher cost.

Table 8-2. Disposal of Wastewater (Non-recycled water, AFY) (DWR Table 22)

Method of Disposal	Treatment Level	Time of Use	2010	2015	2020	2025	2030	2035
Ceres WWTP (evaporation/ percolation ponds)	Secondary	All Year	2,200	2,100	2,800	2,800	2,800	2,800
Export to City of Modesto	Secondary, Tertiary	All Year	1,500	1,500	1,500	1,500	1,500	1,500
Export to City of Turlock	Secondary, Tertiary	All Year	1,100	2,200	2,200	2,200	2,200	2,200
Future Export (location to be determined)[(a)]	Secondary, Tertiary	All Year	0	0	200	1,200	2,100	3,100
		Total	4,800	5,800	6,700	7,700	8,600	9,600

[(a)] The City is currently evaluating future wastewater disposal options as part of its Wastewater Collection System Master Plan. Options under consideration are export to the City of Modesto or the City of Turlock.

8.3.2 Current Recycled Water Use

The City does not currently have any recycled water use, as shown in Table 8-3.

Table 8-3. 2005 UWMP Recycled Use Projection Compared to 2010 Actual, AFY (DWR Table 24)

Use Type	Actual 2010	2005 Projection for 2010
Agricultural irrigation	0	0
Landscape irrigation [(a)]	0	130
Commercial irrigation	0	0
Golf course irrigation	0	0
Wildlife habitat	0	0
Wetlands	0	0
Industrial re-use	0	0
Groundwater recharge	0	0
Seawater barrier	0	0
Geothermal/Energy	0	0
Indirect potable reuse	0	0
Indirect potable reuse	0	0
Total	0	130

[(a)] There is nominal use of recycled water for landscape irrigation at the WWTP. This usage was reported as 130 AFY in the 2005 UWMP.

8.4 POTENTIAL RECYCLED WATER USES

The City has conceptually explored the possibility of upgrading its wastewater treatment plant for the production of tertiary-treated recycled water which could be used for irrigation purposes (and thus offset current and future potable water demands). Recycled water is considered to be a reliable water source because it is consistently available. A study was done to examine areas in the City where recycled water could be used (such as parks, landscape medians, golf courses, *etc.*). Detailed analyses showed that it would not be cost effective to build a tertiary treatment plant, and install dual piping (*e.g.*, purple pipe) to parks and other large landscaped areas within the City. The Regional Water Quality Control Board is also reluctant to add another surface water discharger to the San Joaquin River.

In addition to the available non-potable water pumped from the City's irrigation wells to irrigate several of its public parks, many areas within the City have access to inexpensive and high quality TID water for irrigation. In 2008, a total of 231 parcels within the City received irrigation water from TID. Because of the low cost and satisfactory nature of the current TID supplied irrigation water, it is unlikely that this can be replaced cost effectively by new, highly treated recycled water supplies. As a result of these factors, the City has determined that it is not economically feasible to implement recycled water.

Table 8-4 lists potential recycled water options for the City. However, the City does not anticipate any future recycled water use, based on the economics of developing recycled water, compared with other wastewater disposal options.

8.5 POTENTIAL AND PROJECTED USE, OPTIMIZATION PLAN WITH INCENTIVES

Water Code § 10633 (e)(f)

The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

8.5.1 Potential and Projected Use

Due to the high cost of tertiary treatment compared with other wastewater disposal options, the City does not plan to develop tertiary treatment capacity to allow for recycled water use. Based on the City's current situation, past studies, current and anticipated regulatory requirements, and evaluation of cost needed to implement potentially feasible alternatives, the option of diverting additional flow to both the City of Modesto and the City of Turlock is the most economically feasible long-range plan for the City's wastewater treatment and disposal.

Table 8-4. Potential Recycled Water Use, AFY (DWR Table 23)

User Type	Description	Feasibility	2015	2020	2025	2030	2035
Agriculture	Agricultural irrigation using secondary treated recycled water	Not economically feasible due to the availability of high quality, low cost surface water for irrigation from the Turlock Irrigation District	0	0	0	0	0
Urban irrigation (landscape irrigation for parks, golf courses and schools) and industrial use	Recycled water production at WWTP for urban landscape irrigation and industrial reuse	Not economically feasible due to the availability of low cost water for irrigation	0	0	0	0	0
Environmental (includes wildlife habitat and wetlands)	Streamflow augmentation, wildlife habitat restoration, wetland enhancement or other related environmental purposes	Not applicable	0	0	0	0	0
Groundwater recharge (includes indirect potable reuse)	Groundwater recharge through percolation or direct injection into the groundwater basin. Requires advanced treatment	Currently not feasible, due to treatment requirements and associated project costs	0	0	0	0	0
Seawater barrier	Injection of recycled water to the groundwater basin to prevent seawater intrusion	Not applicable	0	0	0	0	0
Geothermal/Energy	Use of recycled water for cooling or process water for energy generation applications	Not applicable	0	0	0	0	0
		TOTAL	0	0	0	0	0

Under current Regional Board policy, regionalization is preferred wherever feasible. Regionalizing with the City of Modesto and City of Turlock (part of the IRWM prices) should provide greater economies of scale than the City constructing its own treatment and disposal facilities. The better alternative between export to the City of Modesto or only to the City of Turlock will depend on the extent of economies of scale between these facilities and the relative cost of future capacity.

In the future, if it becomes more technically and financially feasible, the City may reconsider its future use of recycled water. However, for the purposes of this UWMP, it will be assumed that tertiary-treated recycled water will not be available in the City to offset potable water demands.

8.5.2 Optimization Plan with Incentives

No optimization plan is presented because the City has not found it cost effective to implement recycled water at this point in time. Therefore, as shown on Table 8-5, there are no identified measures to promote recycled water use. On a long-term basis, the City will continue to explore regionalization options and regional wastewater treatment opportunities.

Table 8-5. Measures to Encourage Recycled Water Use (DWR Table 25)

Measure to Promote Recycled Water Usage	Projected Resulting Recycled Water Use, AFY[(a)]
None[(a)]	N/A

N/A = Not Applicable

(a) No measures are identified to encourage recycled water use, since the City has not found implementing recycled water use to be a cost-effective alternative at this point.

Water Code § 10635 (a),(c)

(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

9.1 NORMAL YEAR SUPPLY AND DEMAND COMPARISON

9.1.1 Normal Year Supply

As discussed in Chapter 3, the City will continue to use groundwater as the sole source of supply to meet demands in the near-term. The City is evaluating participation in the RSWSP, which will provide a supplemental source of water supply to the City. This project is assumed to be on-line by 2018. Assuming the City's participation in the RSWSP, the City's groundwater production will be supplemented by treated surface water use, which will increase the City's groundwater storage. Therefore, the City will be able to meet future demands through a combination of groundwater and treated surface water supplies. Reductions in groundwater pumpage will allow groundwater currently in storage to remain in the groundwater basin for future use. As shown in Table 9-1, the City's normal year water supply is projected to be 19,800 AFY by 2035. This represents a 138 percent growth in supply as compared to 2010.

Table 9-1. Normal Year Water Supply, AFY

Supply	2010 (actual)	2015	2020	2025	2030	2035
Groundwater Pumping	8,284	10,700	5,600	8,100	10,600	13,100
Potential RSWSP Surface Water	0	0	6,700	6,700	6,700	6,700
Total	8,284	10,700	12,300	14,800	17,300	19,800
Percent of 2010		129%	149%	179%	209%	238%

9.1.2 Normal Year Demand

As shown in Table 9-2, the City's buildout water demand is projected to reach approximately 19,800 AFY by the year 2035. As described in Chapter 4, this water demand projection is based on the City's compliance with its SBx7-7 per capita water use targets (interim target of 219 gpcd in 2015 and final target of 194 gpcd in 2020 and in subsequent years). This represents a demand increase of approximately 138 percent as compared to 2010 demands.

Table 9-2. Normal Year Water Demands, AFY						
Supply	2010 (actual)	2015	2020	2025	2030	2035
Demand[(a)]	8,284	10,700	12,300	14,800	17,300	19,800
Percent of 2010		129%	149%	179%	209%	238%

(a) Water demand projection is based on the City's compliance with its SBx7-7 per capita water use targets (interim target of 219 gpcd in 2015 and final target of 194 gpcd in 2020 and in subsequent years) (see Chapter 4).

9.1.3 Normal Year Comparison

Table 9-3 compares supply and demands through 2035 during a normal hydrologic year condition. The City projects adequate supply to meet demands through 2035.

Table 9-3. Supply and Demand Comparison—Normal Year, AFY (DWR Table 32)						
Supply	2010 (actual)	2015	2020	2025	2030	2035
Supply Totals (from Table 9-1)	8,284	10,700	12,300	14,800	17,300	19,800
Demand Totals (from Table 9-2)	8,284	10,700	12,300	14,800	17,300	19,800
Difference	0	0	0	0	0	0
Difference as Percent of Supply	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Difference as Percent of Demand	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

9.2 SINGLE DRY YEAR SUPPLY AND DEMAND COMPARISON

9.2.1 Single Dry Year Supply

As shown in Table 9-4, the City's projected supply in a single dry year is expected to increase from 8,284 AFY in 2010 to approximately 19,800 AFY by 2035. The City's water supply during a single dry year is assumed to be reduced by 10 percent as described in Chapter 6. However, once surface water supply is available, assumed in 2018, groundwater will be used conjunctively with RSWSP supplies to meet demands, and more groundwater may be used in dry years to meet demands when surface water supply is reduced. Therefore, in 2020 and later, total supplies are shown to meet 100 percent of total demand.

Table 9-4. Single Dry Year Water Supply, AFY

	2010 (actual)	2015	2020	2025	2030	2035
Groundwater Pumping[a]	8,284	9,600	6,300	8,800	11,300	13,800
Potential RSWSP Surface Water[b]	0	0	6,000	6,000	6,000	6,000
Total	8,284	9,600	12,300	14,800	17,300	19,800
Percent of Normal	100%	90%	100%	100%	100%	100%

[a] In 2020 and later years, groundwater supplies are assumed to be used conjunctively with RSWSP surface water supplies to meet demands and may be used more in dry years to meet demands when surface water supply is reduced.
[b] Reduction in RSWSP supplies as compared to a normal year is based on a 10 percent reduction in dry years.

9.2.2 Single Dry Year Demand

As shown in Table 9-5, the City's water demand is projected to increase from 8,284 AFY in 2010 to 19,800 AFY in a single dry year by 2035. However, once the City has a surface water supply, assumed by 2020, the City will conjunctively use groundwater supply to meet demands in dry years. Therefore, demands in 2020 and later are assumed to be equal to normal year demands. During dry years, the City will review its Water Shortage Contingency Plan to determine the appropriate measures to take in order to achieve demand reductions, if needed to match available supplies.

Table 9-5. Single Dry Year Water Demands, AFY

	2010 (actual)	2015	2020	2025	2030	2035
Demand	8,284	9,600	12,300	14,800	17,300	19,800
Percent of Normal	100%	90%	100%	100%	100%	100%

9.2.3 Single Dry Year Comparison

As shown in Table 9-6, a single dry year demand is projected to be met through a combination of surface water and groundwater in all years.

Table 9-6. Supply and Demand Comparison—Single Dry Year, AFY (DWR Table 33)

	2010 (actual)	2015	2020	2025	2030	2035
Supply Totals (from Table 9-4)	8,284	9,600	12,300	14,800	17,300	19,800
Demand Totals (from Table 9-5)	8,284	9,600	12,300	14,800	17,300	19,800
Difference	0	0	0	0	0	0
Difference as Percent of Supply	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Difference as Percent of Demand	0%	0%	0%	0%	0%	0%

9.3 MULTIPLE DRY YEARS SUPPLY AND DEMAND COMPARISON

9.3.1 Multiple Dry Year Supply

As shown in Table 9-7, the City's projected supply during a multiple dry year condition is expected to increase to approximately 19,800 AFY by 2035. Based on the water reliability assumptions developed in Chapter 6, water supply would be reduced by 5%, 10%, 15%, and 15% for the four years of a multiple dry year period. However, once surface water supply is available, assumed in 2018, groundwater will be used conjunctively with RSWSP supplies to meet demands, and more groundwater may be used in dry years to meet demands when surface water supply is reduced. Therefore, in 2020 and later, total supplies are shown to meet 100 percent of total demand. A cutback of RSWSP supplies by 15 percent is the greatest cutback currently expected to occur.

Table 9-7. Multiple Dry Year Water Supply, AFY

		4-Year Dry Period Beginning				
		2015	2020	2025	2030	2035
Multiple dry year first year supply	Groundwater Pumpage[a]	10,200	5,900	8,400	10,900	13,400
	Potential RSWSP Surface Water[b]	0	6,400	6,400	6,400	6,400
	Total Supply	10,300	12,300	14,800	17,300	19,800
Multiple dry year second year supply	Groundwater Pumpage[a]	9,600	6,300	8,800	11,300	13,800
	Potential RSWSP Surface Water[b]	0	6,000	6,000	6,000	6,000
	Total Supply	9,600	12,300	14,800	17,300	19,800
Multiple dry year third year supply	Groundwater Pumpage[a]	9,100	6,600	9,100	11,600	14,100
	Potential RSWSP Surface Water[b]	0	5,700	5,700	5,700	5,700
	Total Supply	9,100	12,300	14,800	17,300	19,800
Multiple dry year fourth year supply	Groundwater Pumpage[a]	9,100	6,600	9,100	11,600	14,100
	Potential RSWSP Surface Water[b]	0	5,700	5,700	5,700	5,700
	Total Supply	9,100	12,300	14,800	17,300	19,800

[a] Groundwater supply is based on the assumption that pumpage would be reduced 5%, 10%, 15%, and 15% for the four years of a multiple dry year period prior to implementation of surface water supply. Once surface water supply is available, assumed by 2020, groundwater will be used conjunctively with RSWSP supplies to meet demands, and may be used more in dry years to meet demands when RSWSP supply is reduced.

[b] Potential RSWSP surface water deliveries are based on the assumption that water supply would be reduced 5%, 10%, 15%, and 15% for the four years of a multiple dry year period.

9.3.2 Multiple Dry Year Demand

As shown in Table 9-8, water demands for the City during a multiple dry year condition is expected to be equal to normal year demands for 2020 and later years, once groundwater can be used conjunctively with surface water supply. The City will review its Water Shortage

Contingency Plan during dry years to determine the appropriate measures to take in order to achieve demand reductions, if needed. For purposes of this UWMP, it is assumed that demands for all multiple dry year scenarios are equal to multiple dry year water supplies.

Table 9-8. Multiple Dry Year Water Demands, AFY

	5-Year Dry Period Beginning				
	2015	2020	2025	2030	2035
Multiple Dry Year First Year Demand	10,200	12,300	14,800	17,300	19,800
Multiple Dry Year Second Year Demand	9,600	12,300	14,800	17,300	19,800
Multiple Dry Year Third Year Demand	9,100	12,300	14,800	17,300	19,800
Multiple Dry Year Fourth Year Demand	9,100	12,300	14,800	17,300	19,800

9.3.3 Multiple Dry Year Comparison

As shown in Table 9-9, the projected multiple dry year supply is sufficient to meet demands in all years.

Table 9-9. Supply and Demand Comparison--Multiple Dry Year, AFY (DWR Table 34)

		5-Year Dry Period Beginning				
		2015	2020	2025	2030	2035
Multiple Dry Year First Year Supply	Supply Totals (from Table 9-7)	10,200	12,300	14,800	17,300	19,800
	Demand Totals (from Table 9-8)	10,200	12,300	14,800	17,300	19,800
	Difference	0	0	0	0	0
	Difference as Percent of Supply	0%	0%	0%	0%	0%
	Difference as Percent of Demand	0%	0%	0%	0%	0%
Multiple Dry Year Second Year Supply	Supply Totals (from Table 9-7)	9,600	12,300	14,800	17,300	19,800
	Demand Totals (from Table 9-8)	9,600	12,300	14,800	17,300	19,800
	Difference	0	0	0	0	0
	Difference as Percent of Supply	0%	0%	0%	0%	0%
	Difference as Percent of Demand	0%	0%	0%	0%	0%
Multiple Dry Year Third Year Supply	Supply Totals (from Table 9-7)	9,100	12,300	14,800	17,300	19,800
	Demand Totals (from Table 9-8)	9,100	12,300	14,800	17,300	19,800
	Difference	0	0	0	0	0
	Difference as Percent of Supply	0%	0%	0%	0%	0%
	Difference as Percent of Demand	0%	0%	0%	0%	0%
Multiple Dry Year Fourth Year Supply	Supply Totals (from Table 9-7)	9,100	12,300	14,800	17,300	19,800
	Demand Totals (from Table 9-8)	9,100	12,300	14,800	17,300	19,800
	Difference	0	0	0	0	0
	Difference as Percent of Supply	0%	0%	0%	0%	0%
	Difference as Percent of Demand	0%	0%	0%	0%	0%

CHAPTER 10
Water Shortage Contingency Plan

10.1 OVERVIEW

Water Code § 10632

The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(h) A draft water shortage contingency resolution or ordinance.

(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

The City adopted a No Waste Ordinance in 1977 (Appendix H), and the City adopted a Water Shortage Contingency Plan in 1991 (Appendix I). The City reviewed its Water Shortage Contingency Plan during the preparation of this UWMP Update, and found that it is sufficient to meet the City's needs as a planning and action guide. The City also developed a draft resolution to declare a Water Shortage Emergency (Appendix J), should one occur.

10.2 STAGES OF ACTION

The City has developed a four-stage action plan (Table 10-1) to invoke during a declared water shortage. The plan includes voluntary and mandatory rationing, depending on the causes, severity, and anticipated duration of water supply shortages, if known. Action stages may be triggered by a shortage at any time of the year. If it appears that it may be a dry year, mainly due to insufficient precipitation and further dropping of the groundwater table, the City can take action in advance of a crisis. Any combination of at least three of the water shortage trigger criteria occurring will institute the corresponding Stage actions. Table 10-1 summarizes the four stages, their triggers, and their corresponding water use reduction objectives.

Table 10-1. Rationing Stages to Address Water Supply Shortages (DWR Table 35)

Stage Number	Water Supply Condition	Water Supply Condition Triggers for Stage Determination	Supply Shortage (%) (Demand Reduction Objective % from baseline)	Program Type
I	Minimal Shortage Potential	• Below average rainfall in the previous 12-24 months. • 10% or more of City wells out of service due to noncompliance with drinking water standards or drop in static groundwater levels. • Irrigation allotments by local irrigation districts reduced by 15%. • Extended warm weather patterns typical of summer.	15%	Voluntary / Mandatory
II	Moderate Shortage Potential	• Below average rainfall in the previous 24 to 36 months • Prolonged periods of low water pressure. • 10% or more of City wells out of service due to noncompliance with drinking water standards or drop in groundwater. • Irrigation allotments by local irrigation districts reduced by 25%. • Extended warm weather patterns typical of summer.	15% to 25%	Voluntary / Mandatory
III	Severe Shortage Potential	• Below average rainfall in the previous 36-48 months. • Prolonged periods of low water pressure. • 10% or more of City wells out of service due to noncompliance or drop in groundwater levels. • Irrigation allotments by local irrigation districts reduced by 35%. • Extended warm weather patterns typical of summer.	25% to 35%	Voluntary / Mandatory
IV	Critical Shortage Potential	• Below average rainfall in the previous 24 to 48 months • Prolonged periods of low water pressure. • 10% or more of City wells out of service due to noncompliance with drinking water standards or drop in groundwater levels. • Irrigation allotments by local irrigation districts reduced by 50%. • Extended warm weather patterns typical of summer.	35% to 50%	Voluntary / Mandatory

10.3 CATASTROPHIC SUPPLY INTERRUPTION PLAN

As part of the requirements for the California Department of Public Health (DPH) distribution system operating permit, the City is preparing an *Emergency Response Plan* which identifies specific actions and procedures to follow during a catastrophic event interrupting the City's supplies. Per the DPH Emergency Response Plan guidelines, the response plan will include procedures to assess and address water system issues during a variety of emergency events, including contamination events, power outages, and natural disasters, such as floods or earthquakes. The plan identifies specific protocols to: initiate action, notify and coordinate with emergency personnel, identify and repair water system problems, re-establish normal service, and report on findings to review effectiveness of the response plan following an incident. The City anticipates completing this plan and submitting it to DPH in 2011.

10.4 PROHIBITIONS, CONSUMPTION REDUCTION METHODS AND PENALTIES

A No Waste Ordinance has been in effect since 1977 (Appendix H). The ordinance prohibits various wasteful water uses such as outdoor irrigation during high evaporation times, having leaky sprinklers or fixtures, and washing of hardscapes without first obtaining a waiver. Warnings and penalties are levied for infractions to the ordinance.

Examples of consumption reduction methods that could be instituted during a drought period include: water use prohibitions (especially for landscape irrigation); additional water conservation enforcement; voluntary rationing, mandatory rationing; reduction of water pressure in water lines where feasible; flow restrictions; expansion of leak detections and repair programs; installation of water kits, plumbing fixture replacements; restrictions on building permits; installation of pool covers; and water shortage pricing. Table 10-2 summarizes the City's Requested Consumer Actions listed by water shortage stage.

Any customer violating the regulations and restrictions on water use set forth in the City's No Waste Ordinance and Water Shortage Contingency Plan shall first receive a written warning for the first violation. However, a fine is issued for a second violation, and increasingly expensive fines are issued for any subsequent violations thereafter (all penalties are assessed for violations occurring within 12 months of first violation). Table 10-3 summarizes the City's warnings, penalties, and charges for excessive water use listed by water shortage stage.

Table 10-2. Requested and Mandatory Water Use Prohibitions and Consumption Reduction Methods (DWR Tables 36 and 37)

Stage	Requested and Mandatory Consumer Actions	Water Use Reduction (%)
I	• Residential Customers 1. Implement voluntary water use reductions (15%) 2. Voluntarily install water conservation kits, remodel with low flow fixtures, and install water efficient landscaping and irrigation systems. 3. Adhere to Water Conservation Program. • Commercial, Industrial, and Governmental Customers 1. Implement actions listed under Residential Customers. 2. Research water re-use options. 3. Improve cooling efficiency.	15%
II	• Residential, Commercial, Industrial, and Governmental Customers 1. Adhere to measures listed in Stage I, except implement voluntary use reduction by 25%. 2. Comply with landscaping ordinance for new landscaping.	15% to 25%
III	• Adhere to measures in Stage II. • Manage water consumption to stay within water reduction goals. Suggest weekly water meter reading for metered customers.	25% to 35%
IV	• Adhere to measures in Stage III. • Reduce irrigation as listed in Section listed under Public Agency Actions. • Wash vehicles, boats, *etc.*, at car washes utilizing recycled water. • No outdoor water use except for trees and shrubs by hand, and vegetation maintained through drip irrigation. • Car washing permitted at car wash facilities only.	35% to 50%

Table 10-3. Penalties and Charges for Excessive Water Use (DWR Table 38)

Stage	Warnings, Penalties, and Charges
I	1. One warning "Notice of Ordinance Violation". 2. Levy fines "Notice of Intention to Impose a Fee for Water Wasting": $20, first fine; $50, second fine; $100, third fine; $200, fourth and subsequent fines. 3. Installation of water meters 4. Discontinue water service, levy shut-off, and re-connection fees.
II	1. One warning. 2. Levy heavy fine: $50, first fine; $100, second fine; $200, third fine; $300, fourth and subsequent fines. 3. Installation of water meters 4. Discontinue water service, levy shut-off, and re-connection fees.
III	1. One warning. 2. Levy heavy fine: $50, first fine; $100, second fine; $200, third fine; $300, fourth and subsequent fines. 3. Installation of water meters 4. Discontinue water service, levy shut-off, and re-connection fees.
IV	1. One warning. 2. Levy heavy fine: $50, first fine; $100, second fine; $200, third fine; $300, fourth and subsequent fines. 3. Installation of water meters 4. Discontinue water service, levy shut-off, and re-connection fees.

10.5 ANALYSIS OF REVENUE IMPACTS OF REDUCED SALES DURING SHORTAGES

Water rates need to be set up to enable water suppliers to cover the costs in pumping, storing, treating, and delivering water. Revenues also need to be collected to build reserves for future water system repairs, maintenance, and replacement. However, water shortages that result in the implementation of the Water Shortage Contingency Plan are expected to result in reduced water usage, and accordingly, reduced operating revenues. Table 10-4 presents the projected revenue

impacts resulting from implementation of the Water Shortage Contingency Plan based on projected FY 2010/11 revenue and expenses.

Table 10-4. Projected Revenue Impacts from Water Shortage Contingency Plan

	Projected FY 2010/11 [a]	FY 2010/11 Stage I [b]	FY 2010/11 Stage II [c]	FY 2010/11 Stage III [d]	FY 2010/11 Stage IV [e]
Expenditures					
Operating Expenses	$4,672,470	$4,672,470	$4,672,470	$4,672,470	$4,672,470
Total Debt Services	$308,000	$308,000	$308,000	$308,000	$308,000
Total Expenditures	$4,980,470	$4,980,470	$4,980,470	$4,980,470	$4,980,470
Revenue Sources					
Utility Penalties	$124,095	$124,095	$124,095	$124,095	$124,095
Interest on Bank Deposits	$3,600	$3,600	$3,600	$3,600	$3,600
Miscellaneous Water Revenue	$18,500	$18,500	$18,500	$18,500	$18,500
CIP Water Service Fees	$275,000	$260,563	$250,938	$241,313	$226,875
Construction Water	$1,000	$1,000	$1,000	$1,000	$1,000
Water Service Fees	$4,130,000	$3,913,175	$3,768,625	$3,624,075	$3,407,250
Gross Operating Revenues	$4,552,195	$4,320,933	$4,166,758	$4,012,583	$3,781,320
Net Operating Revenue [f]	$(120,275)	$(351,537)	$(505,712)	$(659,887)	$(891,150)

[a] Projected FY 2010/11 expenditures and revenue sources provided by City staff on 04/22/11. FY 2010/11 is an abnormal year in which gross operating revenues are projected to be less than operating expenses, due to economic conditions.
[b] Assumes 15% water use reduction from "normal" where "normal" is equal to projected FY 2010/11. Calculations assume all commercial and residential customers are billed on a metered rate schedule that will be implemented in early 2012.
[c] Assumes 25% water use reduction from "normal" where "normal" is equal to projected FY 2010/11.
[d] Assumes 35% water use reduction from "normal" where "normal" is equal to projected FY 2010/11.
[e] Assumes 50% water use reduction from "normal" where "normal" is equal to projected FY 2010/11.
[f] Net Operating Revenue = Gross Operating Revenues – Operating Expenses.

It should be noted that operating expenses may also be impacted due to lower customer water demands which may result in a need to pump less groundwater; however, the potential decrease in operating expenses has not been estimated for the purposes of this analysis.

Historically, the majority of customers in the City have been billed at a flat rate. The City is currently completing a metering program to transition flat-rate customers to metered use. A metered rate schedule with volumetric charges will be implemented in early 2012. Changes in revenue due to drought presented in Table 10-4 are projected assuming all customers are metered. Since the City has not yet adopted metered rates, the information presented in the table is an estimate, and an accurate quantitative analysis of potential rate impacts due to reduced revenues cannot be performed. Therefore, Table 10-4 is subject to refinement as metered sales data is collected. Once there is a metered sales history, the City will be able to evaluate potential rate impacts due to water shortage reductions.

In order to mitigate the financial impacts of a water shortage, the City would need to rely on reserves and increased water rates, when justified. Other potential funding sources and/or shortage management options include close monitoring, managing the short-term water reduction plan, initiating a water shortage contingency fund and/or temporary deferral of capital

improvement projects. There may be additional outside funding sources made available to water agencies under a water emergency situation (Stage IV).

Expenditure impacts resulting from implementation of the Water Shortage Contingency Plan may be addressed through implementation of similar measures identified to address revenue impacts including rate adjustments, employee salary reduction, employee furloughs, water shortage contingency fund, temporary deferral of capital improvement projects, and additional outside funding sources. Proposed measures for overcoming revenue and expenditure impacts are summarized in Table 10-5.

Table 10-5. Proposed Measures to Overcome Revenue and Expenditure Impacts

Measure	Check if Discussed
Rate Adjustment	✓
Employee Salary Reduction and Furloughs	✓
Water Shortage Contingency Fund	✓
Temporary Deferral of CIP Projects	✓
Additional Outside Funding Sources	✓

10.6 WATER USE MONITORING

With normal water supply conditions, water production is recorded daily at each wellhead. Totals are reported weekly to the Water Superintendent, and monthly to the Director of Public Works. Reporting escalates with advanced stages of water shortages. During water emergency shortages, production figures would be reported to the Water Superintendent hourly, and to the Director of Public Works and City Manager daily. Reports would also be provided to the City Council and the Public Safety Department.

In addition, the City is in the process of converting all customers to meters, with associated AMI software, allowing real-time collection of water use data. Once the conversion to meters is complete (anticipated by April 2011), the City will be able to determine reductions in demand based on metered usage. Table 10-6 summarizes the City's water use monitoring mechanisms. If reduction goals are not met, the City Council would be notified so that additional action may be taken (water shortage emergency).

Table 10-6. Water Use Monitoring Mechanisms

Mechanism for Determining Actual Reductions	Type of Data Expected
Groundwater Well Monitoring	Production Volume
Water Meters	Customer Water Use

10.7 DRAFT RESOLUTIONS

The City adopted a Water Shortage Contingency Plan in 1991 (Appendix I). If shortages in water supplies were to occur, the City will review the Water Shortage Contingency Plan to determine the appropriate provisions to be implemented.

CHAPTER 11
Adoption and Implementation of the UWMP

11.1 PLAN ADOPTION

Water Code §10642

After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

The 2010 City of Ceres UWMP Update was adopted by the Ceres City Council on June 27, 2011. The resolution for adoption by the Ceres City Council is included in Appendix B.

11.2 PLAN SUBMITTAL TO DWR AND CALIFORNIA STATE LIBRARY

Water Code §10644(a)

An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

Within 30 days of adoption of the 2010 UWMP, the adopted 2010 UWMP will be provided to the Department of Water Resources and the California State Library.

In addition, the City submitted the adopted 2010 UWMP to DWR using the DWR Online Submittal Tool (DOST). A copy of the submitted information is included in Appendix K.

11.3 PROVISION OF ADOPTED PLAN TO CITIES, COUNTIES AND OTHER STAKEHOLDERS

Water Code §10635(b)

The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

Water Code §10644(a)

An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

Within 30 days of adoption of the 2010 UWMP, the adopted 2010 UWMP, including the Water Supply Reliability section, will be provided to the following agencies:

- City of Modesto,
- City of Turlock,
- Stanislaus County, and
- Turlock Irrigation District.

11.4 PLAN AMENDMENTS AND CHANGES

Should this 2010 UWMP be amended or changed, copies of amendments or changes to the plan shall be submitted to DWR, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

11.5 PLAN AVAILABILITY

Water Code §10645

Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

Within 30 days of submitting the adopted 2010 UWMP to DWR, copies of the adopted 2010 UWMP will be made available during normal business hours at the following locations:

- City of Ceres, Public Works Department, 2220 Magnolia Street, Ceres, CA 95307
- City of Ceres, Library, 2250 Magnolia Street, Ceres, CA 95307
- City of Ceres, Community Center, 2701 Fourth Street, Ceres, CA 95307

A copy of the adopted 2010 UWMP will also be available on the City's website:

- City of Ceres website (http://www.ci.ceres.ca.us)

11.6 PLAN IMPLEMENTATION

Water Code §10643

An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

The City is committed to the implementation of the programs discussed in this 2010 UWMP. In particular, the City will implement the conservation programs outlined in the City's Conservation Plan (as summarized in Chapter 5) to reduce per capita water use and meet the City's SBx7-7 per capita water use targets for 2015 and 2020. Also, the City will continue to pursue potential future water supplies, such as the proposed RSWSP, to enhance the reliability of the City's water supply portfolio to meet the future needs of the City's water service area.